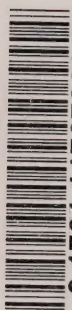


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Technological Institute Graduates

1967-1968

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CAREER OUTLOOK

Technological Institute Graduates

1967-1968

Canada

Manpower Information and Analysis Branch
PROGRAM DEVELOPMENT SERVICE
Department of Manpower and Immigration
Ottawa

Hon. Jean Marchand
Minister

Tom Kent
Deputy Minister

CAREER OUTLOOK

Technological Institute of Canada

1967-1968

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This booklet is intended for anyone interested in the labour market as it relates to graduates of institutes and colleges of technology and applied arts. It is designed in particular for the students and graduates of these institutions, high school students, teachers, vocational counsellors, and prospective employers of technological institute graduates. The booklet is available from Canada Manpower Centres and from the Professional and Technical Occupations Section of the Department of Manpower and Immigration in Ottawa as is a companion *Career Outlook* booklet relating to university graduates.

Following a discussion of general developments in this field, individual disciplines are dealt with in detail. Later, Table One estimates the average starting salaries offered to graduates in 1966 and 1967, and Table Two estimates the number of graduates by discipline of each institute in 1967 and 1968.

The term "technologist" is coming to have a special and distinct meaning. Such a person is chiefly concerned with the application and operation of engineering, business, or other scientific equipment and processes. The technologist's training consists of a more practical orientation than is the case in most university programs, but of a more theoretical and academically demanding content than is the case in vocational schools. This training prepares the technologist to serve as a liaison between the professional engineer, scientist, or manager, and the skilled tradesman. In many cases he must have some familiarity with skilled trades but not the ability to perform as a craftsman. Instead, his work involves carrying out the more routine but nonetheless complex tasks of the professional. While he can be almost immediately productive without an extensive period of further training after graduation, the technologist has sufficient versatility and potential to permit future flexibility. To be admitted to a technological course, the student must ordinarily have completed junior matriculation (Grade 11 in most provinces) or Grade 12 in Ontario. This requirement places technological institutes in the tertiary or post-secondary level of education, yet their admission requirements are generally not as high as those of the universities.

Technological institutes, in training such technicians and technologists, thus serve a unique function which is distinct from both the university and the vocational school. They offer the best course of study for many people and serve a need not met by any other educational program. While several such institutes also provide vocational courses, it is their role in producing technologists and graduates in other disciplines at an equivalent level that is the concern of this booklet.

The 1966-67 enrolment at Canadian institutes of technology was about 27,700 full-time students in tertiary level courses. This represents an increase of about 27.6 per cent over the previous year. The number of 1967 graduates was approximately 6,800 with about 10,775 expected to graduate in 1968.

The most significant current development in the area of technological education in Canada is the establishment of 18 colleges of applied arts and technology in Ontario. The names and locations of the new institutions, apart from Ryerson Polytechnical Institute in Toronto and the Technical Division of Lakehead University in

INTRODUCTION

The Technologist

Growth of Technological Institutes

Port Arthur, are as follows: Algonquin College (absorbing the Eastern Ontario Institute of Technology), Ottawa; St. Clair College (absorbing the Western Ontario Institute of Technology), Windsor; Northern College (absorbing the Northern Ontario Institute of Technology and the Provincial Institute of Mining), Timmins; Mohawk College (absorbing the Hamilton Institute of Technology), Hamilton; Centennial College, Scarborough; Fanshawe College, London; Lambton College, Sarnia; St. Lawrence College, Kingston and Cornwall; Sir Sandford Fleming-Loyalist College, Peterborough and Belleville; Durham College, Oshawa; Humber College, Etobicoke; Seneca College, Willowdale; Sheridan College, Brampton; Niagara College, Welland; Conestoga College, Kitchener; Georgian College, Barrie; Cambrian College, North Bay, Sudbury and Sault Ste Marie; and Confederation College, Fort William. All these colleges were expected to be in operation in September, 1967, although many of them in only temporary quarters.

Quebec has 14 technological institutes including a new one at Sept-Iles as well as a number of institutes of a more specialized nature. With the construction of the new Eastern Nova Scotia Institute of Technology in Sydney, that province joins New Brunswick, Saskatchewan, and Alberta in having two institutes of technology. Newfoundland, Manitoba, and British Columbia each have one. In addition, some technological courses are given at the College of Fisheries, Navigation, Marine Engineering, and Electronics in St. John's, the Nova Scotia Agricultural College, the Nova Scotia Land Survey Institute, the three Alberta agricultural and vocational colleges, and Selkirk and Vancouver City colleges in British Columbia. Many of these technological institutes have expanded their facilities and have added new course offerings for the 1967-68 term which are mentioned in the specific sections which follow.

So rapid has been the growth of the technological institutes that there are considerable differences between the provinces in the duration and content of courses. For example, most courses are three years in length in Ontario and Quebec and two years elsewhere. An effort is being made to ensure that graduates of all institutes of technology receive greater inter-provincial recognition and uniformity in levels of achievement. In an attempt to minimize differences and elevate standards to an adequate level across Canada, an annual conference of administrators is held with representatives from both business and industry in attendance. It has been suggested that the issuing of diplomas to graduates of technological institutes be reserved for those who complete courses requiring a minimum of 2,400 hours attendance after high school graduation. The Diploma of Technology will be designated by "Dipl. T." and the Diploma of Applied Arts by "Dipl. A.A."

Organizations and Advisory Committees

A large number of technologists' organizations have been or are being established. In Quebec, for example, there is the Corporation of Professional Technicians of the Province of Quebec, which has been given, by legislation, the exclusive right to the titles "Certified Technician" and "Professional Technician". Engineering technologists and engineering technicians in Ontario can gain recognition through examination by the certification board of the Association of Professional Engineers of the Province of Ontario in collabora-

tion with the Ontario Association of Certified Engineering Technicians and Technologists. The successful applicant receives a certificate stating his qualifications in one of three possible grades—Engineering Technician, Senior Engineering Technician, and Engineering Technologist. Each Ontario certificate relates to one of ten branches of engineering technology. In Alberta, there is a fourth level, that of Senior Engineering Technologist. In the majority of the other provinces, similar organizations exist or are in the process of being set up. On the national scale, the Chemical Institute of Canada has established a certification plan for chemical technicians and technologists. Technicians in aeronautical technology and related fields may obtain membership, in grades appropriate to their qualifications and standing, in the Canadian Aeronautics and Space Institute.

Advisory committees play a large role in most technological programs as a link between the institutes and the community. These are made up of representatives of business, industry, and other employing agencies and advise the institutes about course offerings and content, equipment, employment opportunities and placement, and awards.

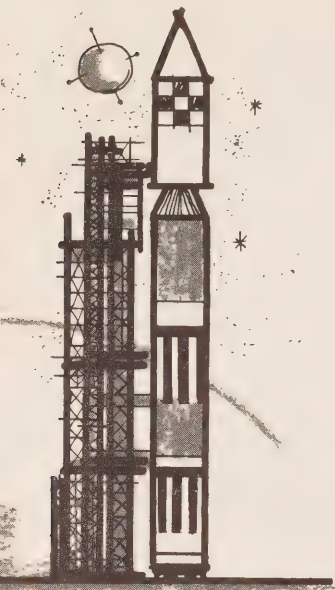
The assistance of a large number of contributors in the preparation of this booklet is gratefully acknowledged. These include many technological institute principals, presidents, and department heads, as well as officials of a number of professional associations.

In addition, technological institute administrators and placement officers, the Pay Research Bureau, and the Education Division of the Dominion Bureau of Statistics have contributed to the surveys upon which the statistical information in the booklet is based.

The Tertiary Education Unit of the Professional and Technical Occupations Section, in its efforts to keep this booklet up to date, welcomes contributions for the next edition including new information on the disciplines covered and suggestions for additional sections.

Acknowledgements

AERONAUTICAL TECHNOLOGY



As a result of the increasing use of aircraft as a means of transportation, the aeronautical industry has become one of the largest employers of scientists, engineers, technicians, and specialized workers. Since 1951, the number of employees working in the mechanics and repair of aircraft has been five times greater than in the mechanical field as a whole.

Three institutes of technology in Canada offer the course in aeronautical technology—the Southern Alberta Institute of Technology, Ryerson Polytechnical Institute, and the Aerotechnical Institute of Quebec at Dorval International Airport.

The Southern Alberta Institute of Technology offers a three-year course in aeronautical engineering technology and a two-year course in aircraft maintenance. The latter deals with the frame and engine of the aircraft and gives the technical training required by the Department of Transport, for the Aircraft Maintenance Engineer's Certificate "A" category. Ryerson offers the course in aeronautical technology, as an option in the third year of mechanical technology.

At the Quebec Aeronautical Institute at Dorval, a three-year course in aeronautics is given, which is similar to the one given at the Southern Alberta Institute of Technology.

In the field of aeronautics, the supply and demand for technicians and technologists is more or less in balance; however, according to the Head of the Aeronautics Department at the Southern Alberta Institute of Technology, the number of graduates in the aircraft maintenance field is not sufficient to meet the strong demand.

Among the functions of the technologist in aeronautics is the design, the analysis, and the checking of aircraft structures, of engines, and of engine parts. The functions also include the supervising of production and the planning for the manufacture of airframes, engines, parts, and instruments; inspection; liaison with engineers, and the technical aspects of selling. These technicians as well establish testing and research plans of installations on the ground and in the air, and evaluate and present the results of these experiments.

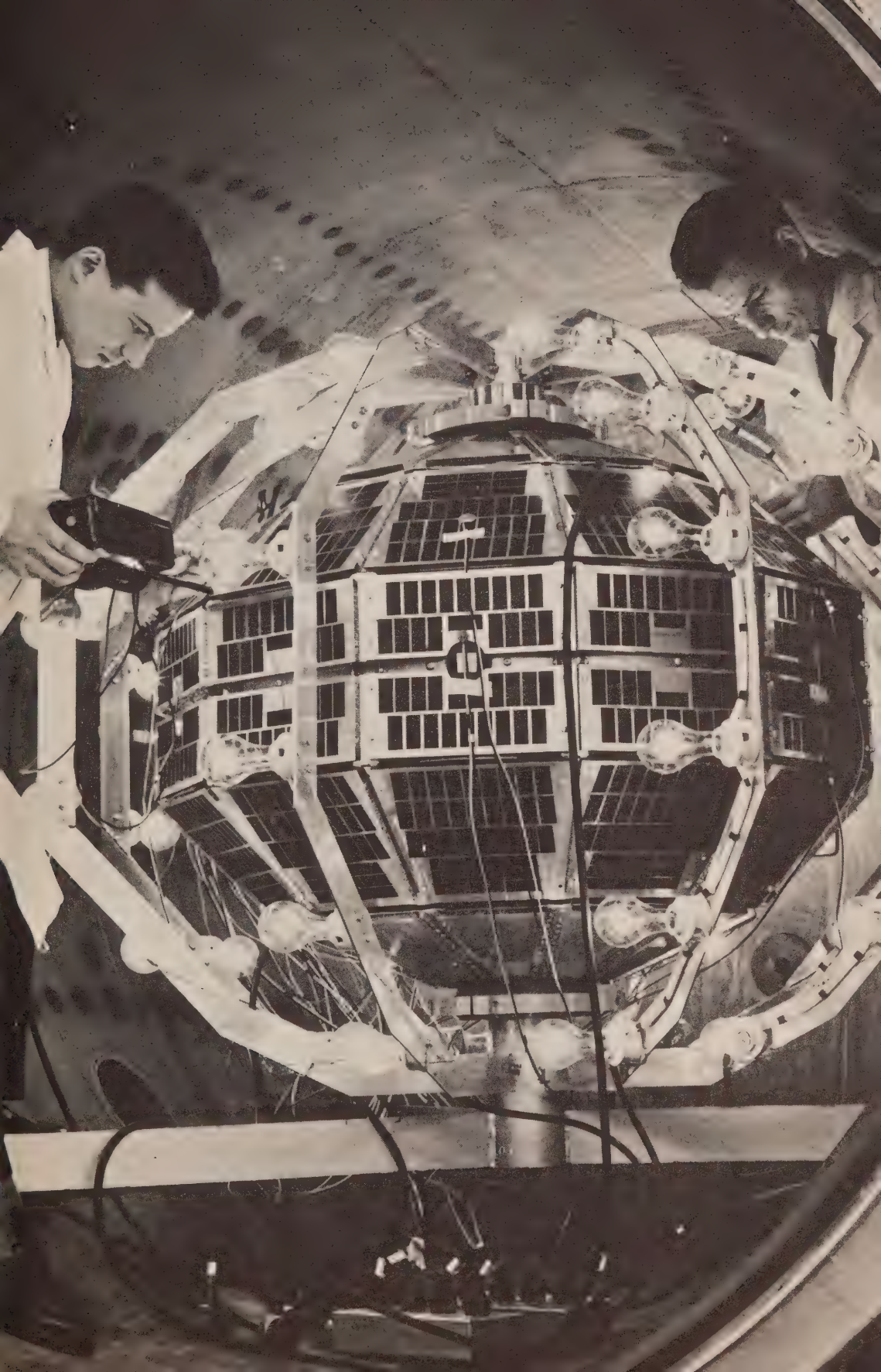
Graduates in aircraft maintenance are employed by aircraft-operating firms across Canada. The industrial development of Northern Canada had as a consequence the increasing utilization of aircraft and the creation of numerous positions for technicians on the mechanical side and in aircraft maintenance.

Starting salaries for aeronautical technicians and technologists are approximately \$500 per month.

AGRICULTURAL TECHNOLOGY

Few of the established institutes of technology offer courses in agricultural technology but in most provinces diploma courses are available at approximately the equivalent level. In some cases high school graduation, while not a prerequisite for admission, is an increasingly common qualification.

The Nova Scotia Agricultural College offers a new two-year technician course in three subjects—agricultural business, animal science, and plant science. Farm experience is not a necessity, but two periods of in-service training must be completed before the candidate receives a diploma. It is anticipated that in the fall of 1968, holders of the technician diploma will be able to take a year of specialized study leading to a diploma of technology.



The only other three-year agricultural technology courses at present are offered at l'Institut de technologie agricole at La Pocatière and l'Institut de technologie agricole at Saint-Hyacinthe, Quebec. The first of these institutes gives courses in laboratory techniques, economics, rural engineering, and plant and animal production; the second offers courses in dairy technology, food technology, food inspection services, cattle and milk production, and horticulture. Together they graduate about 65 students per year.

Five Canadian universities offer diploma courses in agriculture in addition to their degree programs. These are the universities of Guelph, Saskatchewan, Manitoba, and British Columbia, and Macdonald College of McGill University. All of these courses are designed primarily for prospective farmers, although some graduates enter related lines of employment. Programs are of two years' duration, except that of the University of British Columbia which is one year in length.

The diploma course at the University of Guelph is designed to give students an appreciation of science and its application to agriculture. It is designed to train future farmers in farming techniques, those who wish to specialize in agricultural economics or horticulture, and those who will be employed in industries related to agriculture.

Similarly, the diploma program at the University of Saskatchewan, while designed primarily to train students who intend to return to farming, has produced graduates in demand as technicians and in sales organizations.

The diploma course at the University of Manitoba puts special emphasis on farm business management and on the marketing of agricultural products.

The three Alberta agricultural and vocational colleges at Olds, Vermilion, and Fairview offer courses of four 12-week sessions in agriculture, horticulture, and irrigation technology. Graduates of these courses enter a wide variety of employment at salary rates between \$300 and \$400 per month.

Other diploma courses in agriculture of a vocational nature are offered at three New Brunswick schools—Carleton County, St. Basile, and St. Joseph—and at two Ontario schools—Kemptville and Ridgetown.

There is a wide variety of employment opportunities available for graduates in agricultural technology who do not wish to farm. These include research establishments, government regulatory and extension services, and the food industry.

In research, the demand for trained technicians is found largely in faculties of agriculture at Canadian universities, in research programs sponsored by the national and provincial departments of agriculture, and, to a limited extent, in private organizations that are carrying out research on agricultural chemical and food products primarily. Work in this field requires a knowledge of laboratory techniques and instrumentation to be applied in the chemical analysis of soils, nutrition, the physiology of plants and animals, and food processing. Studies in botany, bacteriology, and histology, involving biological techniques and instrumentation as well as the handling of experimental plants and animals, are among the research tasks required of an agricultural technician.

Since the federal government departments are largely responsible

for carrying out the regulatory function in agriculture, the opportunities for technicians in this area are limited to employment with such departments. In this type of employment, a technician would likely be involved in either inspection services or in the testing of agricultural chemicals and pesticides.

The field of agricultural extension is a very broad one. Provincial departments of agriculture throughout Canada have extension personnel who require the support of technicians. Commercial organizations are employing more and more agricultural technicians in their sales organizations. These technicians are required to provide support for the professional people engaged in this field of endeavour.

Service work in the agricultural and food industries involves quality control in the canning, bottling, or packaging of fruits, vegetables, cereals, meats, and all other food products originating from agricultural production. The Agricultural Institute of Canada reports that it is the rapidly expanding food industry that is providing, at present, the greatest and most exciting demand for agricultural technicians.

Technological institutes in Alberta, Ontario, and Quebec offer courses in air conditioning and refrigeration technology. This is a three-year course at the Northern and Southern Alberta Institutes of Technology (commencing at the latter in September, 1968), Fanshawe, and probably other colleges of applied arts and technology in Ontario, and the institutes of technology of Jonquière, Quebec, Laval, Rimouski, Sherbrooke, Vaudreuil, and Trois-Rivières. The Northern Alberta Institute of Technology will revert to a two-year course in September, 1968, and students with advanced standing may complete Southern Alberta's course in two years.

The air conditioning and refrigeration industry is growing rapidly, and graduates are required in temperature control in many areas: in the processing, storage, transportation, and distribution of foods and beverages, in homes, hospitals, offices, industrial plants, stores, schools, theatres, and various modes of transportation. Graduates are presently being employed by mechanical equipment manufacturers and distributors, mechanical contractors, consulting engineers, building maintenance departments, and government agencies, where they work in design, maintenance, and sales.

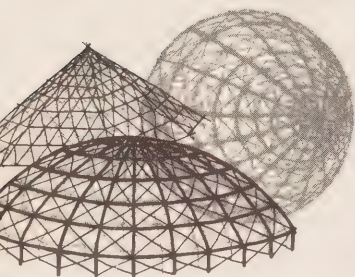
Nearly 100 graduates in air conditioning and refrigeration were produced in 1967 and about 75 are expected in 1968. Salary figures for 1967 graduates were in the \$410 range.

Post-secondary courses in power, operating, or stationary engineering are offered at three technological institutes — Vancouver City College and the Southern Alberta Institute of Technology, Calgary, (two-year courses), and the Manitoba Institute of Technology (one-year course).

Power engineers are responsible for the safe operation of mechanical equipment in industries, utilities, commercial buildings, and institutions. In particular they are engaged in the construction, operation, and repair of steam plants, pressure vessels, or refrigerating plants. They may be employed in the generation of electricity in industrial processes using steam or in the heating of large institutions such as hospitals and universities. Other oppor-

AIR CONDITIONING, REFRIGERATION, AND HEATING

ARCHITECTURAL TECHNOLOGY



tunities include design work with consulting engineers and in industrial sales outlets.

While most institutes of technology giving instruction relative to the design and construction of buildings label the course architectural technology, this name is somewhat misleading. Graduates are equipped to fill a wide variety of positions in the construction industry as a whole, rather than being limited to employment in architects' offices only. In fact, the British Columbia Institute of Technology has named its department Building Technology on the basis of establishing a more accurate designation of the wide scope of training being provided.

Regional variations aside, the essential areas of instruction in these courses are architectural design, drafting, rendering, and history of building; building construction; detailing, preparation of working drawings, and surveying; structural engineering; building services such as plumbing, heating, air conditioning, electrical, and acoustics; specification writing, allied with a study of the properties of material; estimating quantities and costs of individual trades and of complete buildings; contract law and building codes; and, in most schools, English, physics, and mathematics.

The result of this coverage is that a student, by the time he graduates, has a very thorough understanding of a building as a three dimensional creation, with a realistic appreciation of the way in which planning, aesthetics, structure, materials, mechanical services, and costs all interact on one another to influence the relative success of the final result.

Equipped with this knowledge and training, students can then seek employment in the individual areas of the building industry to which their personal abilities and inclinations direct them. Some may enter the offices of architects, interior designers, or consulting engineers to develop into job captains, chief draftsmen, specification writers, estimators, or job superintendents; in contracting organizations or manufacturing firms as estimators, assistant administrators, partners or owners; in public or private corporations as administrators in charge of maintenance, remodelling, additions to or expansion of premises; in material and component manufacturing organizations as designers and developers; in sales organizations as knowledgeable representatives; in private and governmental research and testing departments, or in the teaching profession as specialists in industrial arts.

The Southern Alberta Institute of Technology was the first training organization of this kind in Canada, commencing its architectural course in 1920. It presently offers a three-year and a two-year course, and while it covers most of the subjects referred to above, it is oriented in large degree toward service in architects' offices. A two-year course in planning technology will be added for the 1967-68 session.

The Northern Alberta Institute of Technology and the New Brunswick Institute both place a strong emphasis on working drawings and details.

Ryerson Polytechnical Institute offers a three-year course of great breadth, with a grounding in the core subjects of English, mathematics, and physics, but oriented very positively in the direction of architecture. The department has a very close associa-

tion with the Ontario Architectural Association, and 44 of last year's 51 graduates went into architects' offices.

The Saskatchewan Technical Institute has in the past supplied a number of graduates to government, manufacturers, and distributors, with an increasing number now going into architects' offices. The Newfoundland College of Trades and Technology has also found both levels of government to be the largest potential employers. Landscaping and town planning are included in the course as being especially useful in this category of work.

The British Columbia Institute of Technology, in its two-year course, is preparing graduates for the wide spectrum of possible positions referred to previously. A special effort is made to relate the material given in the various subjects by working out problems in design, structure, services, estimating, and so on, for each major building problem assigned. A high percentage of last year's graduates have become estimators with general contractors.

Lakehead University (Technology Division) offers the first year of the Ryerson program, and students may go on to Ryerson for the final two years. The staff here also is very conscious of the increasing industrialization of the building world and sees its students in the future performing many services outside of the traditional architectural sphere.

The St. Clair College of Applied Arts and Technology began a three-year course in architectural technology in September, 1967.

The institutes of technology at Vaudreuil and Trois-Rivières offer an architectural option in their civil technology courses.

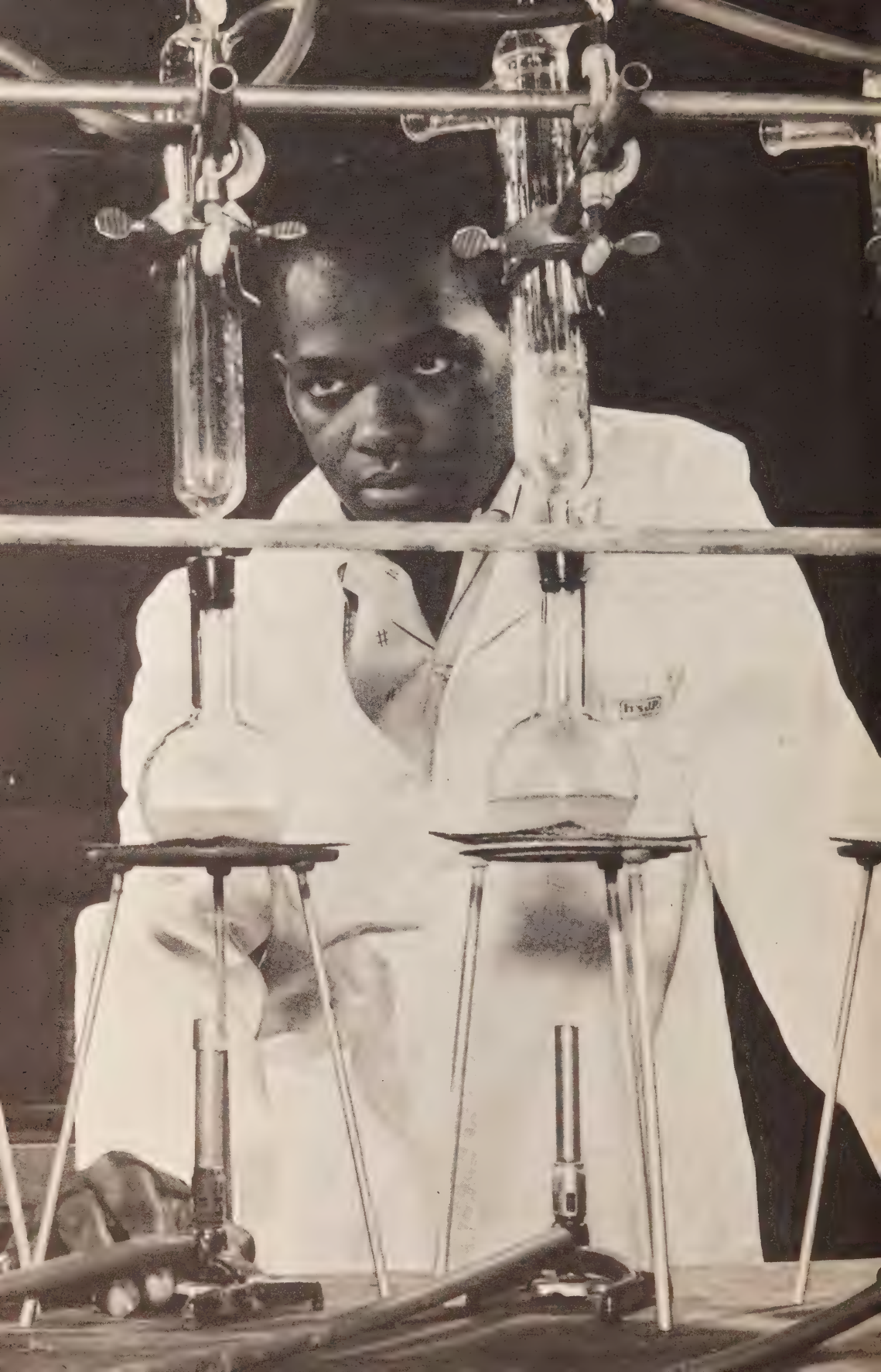
Our knowledge of the behaviour and the nature of living matter is increasing from year to year. Vast strides have recently been made in the field of biological sciences including the study of proteins, of tissues which form the structure of the human body, of nucleic acids, and research in heredity. All this progress in biology originated in the study of the chemistry of living beings, that is, biochemistry.

A three-year course in biochemical technology is offered at the institutes of technology of Shawinigan, Rimouski, and Laval, as well as at the Algonquin College of Applied Arts and Technology which now includes the former Eastern Ontario Institute of Technology. The Institute of Applied Arts and Sciences at Saskatoon is preparing to offer a course in biochemical science in September 1968.

As well as these, Alberta offers a course of two-year's duration in biochemistry at the institutes of technology in Calgary and Edmonton, the latter offering the course beginning in September 1967.

The biochemical technology graduate has become almost indispensable in many types of laboratories. The training which he received prepares him to act in a liaison capacity between the laboratory supervisor and the less specialized technician who can only execute the routine tasks. The biochemical technologist is capable of assimilating the necessary material, of carrying out experimental projects, and of communicating to his supervisor — usually a university graduate — the results of his investigation for interpretation and utilization. In laboratory work, the role of the university graduate is in the planning of the project, while that of the technologist equipped with a solid knowledge of the essential

BIOCHEMICAL TECHNOLOGY



principles of chemistry consists in applying the theory to arrive at practical results.

The biological sciences are undergoing a constant increase in importance, and well-known scientists are of the opinion that students undertaking studies in biochemical technology are assured a wide field of employment possibilities. Presently, graduates in biochemical technology are employed in government laboratories, both provincial and federal, in hospitals, in the food and beverage industry and other industries, and in universities.

Due to the numerous openings in several areas, the 126 graduates expected in 1968 should not experience any difficulty in finding an interesting and well-paid position.

The operations of modern business have become so complex and are changing so rapidly that highly trained employees are required at all levels. While certain personal qualities are also important, the person who wishes to succeed in business must have certain abilities and skills which it is the object of business administration programs to nurture and develop.

Nearly all the technological institutes in the English-speaking parts of Canada offer courses in business administration. These vary in length and emphasis but generally include the following elements: English, mathematics, economics, data processing, accounting, business law, communications, marketing, and management.

According to the Chairman of the Business Department at Ryerson Polytechnical Institute, adaptability to change is one of the most important qualities that should be developed in business administration graduates. Consequently, at that institution less emphasis will be placed in the future on factual, descriptive courses, while data processing and programming will be given additional emphasis.

As in the case of many technology disciplines, business administration courses are generally of two years' duration outside of Ontario and Quebec and of three years' in those two provinces. Two-year courses are offered at the Newfoundland College of Trades and Technology, St. John's; the Saint John Institute of Technology; the Manitoba Institute of Technology, Winnipeg; the Northern and Southern Alberta Institutes of Technology; and the British Columbia Institute of Technology, Burnaby. Three-year courses are given at Ryerson Polytechnical Institute and Lakehead University, and at Algonquin, Northern, St. Clair, Mohawk, Centennial, Fanshawe, Lambton, and undoubtedly other colleges of applied arts and technology in Ontario.

In Quebec, the institutes of technology at Chicoutimi and Jonquière give courses in commercial techniques and Sherbrooke and Laval, courses in commercial science.

In addition to the special programs in business administration treated separately in sections or sub-sections to follow, these special optional courses are available: at Ryerson, financial management; at British Columbia, administrative management; at Northern Alberta, business management, credit administration, and office administration; at Southern Alberta, office and personnel management, banking and finance, and advertising and public relations. The Northern Alberta Institute of Technology also gives a separate course in banking.

BUSINESS ADMINISTRATION

Diploma graduates in business administration may find employment in a great variety of fields. They may be employed in administration, accounting, systems analysis, production, personnel, sales, or research in organizations such as manufacturing industries, accounting firms, banks and trust companies, public utilities, advertising agencies, insurance companies, retail firms, and government departments.

About 777 such graduates entered the labour market in 1967 and another 1,200 are expected in 1968. Salary figures varied considerably but averaged about \$460 per month for 1967 graduates.

Accounting

The radical changes in the business world in recent years have greatly transformed the concept of accounting. While it formerly consisted in large part of keeping a register of business transactions, the accountant's task today has been so automated that he spends most of his time interpreting financial statements and advising management on questions of finance and control. As governmental regulations and taxing systems become more and more complex, the services of an expert in "the language of business" are becoming increasingly indispensable.

Accounting courses are given at a number of technological institutes. The New Brunswick Institute of Technology (Moncton), the Saskatchewan Technical Institute (Moose Jaw), Vancouver City College and the Newfoundland College of Trades and Technology (St. John's) offer full accounting programs. The Northern Alberta Institute of Technology offers accounting as a second-year option in its business administration course, and the British Columbia Institute of Technology gives a two-year course in accounting and financial control.

In Quebec, accounting is offered only as a part of the commercial science course at the technological institutes of Sherbrooke and Trois-Rivières and as part of the commercial techniques course at Chicoutimi and Jonquière.

The student in accounting receives an up-to-date practical and theoretical training which includes the latest technical advances made by automation. Besides accounting proper, the courses include auditing, data processing, economics, commercial law, the mathematics of finance, and business communications. The training received in taxation, according to the Saskatchewan Technical Institute, is especially valued by employers such as the federal government and accounting firms. The expected number of graduates in accounting from institutes of technology in 1968 is about 110, nearly double the 1967 figure.

The demand for accounting graduates is increasing and the employment possibilities are numerous. These graduates can expect an interesting and remunerative career whether in small or large commercial organizations, industrial enterprises, or in government services. Salary rates for 1967 graduates ranged between \$425 and \$450 per month.

Hotel, Motel and Restaurant Management

The hospitality industry is expanding rapidly as a result of longer vacations and a shorter work week. As a consequence, the demand for qualified hotel, motel, and restaurant managers and employees greatly exceeds the supply. While this industry puts strong emphasis on personal service, the manager must also have

the training to deal with a continuous flow of new problems, to plan, and to adapt to rapidly changing conditions.

Courses in hotel, motel, and restaurant management are given at Ryerson Polytechnical Institute, the British Columbia Institute of Technology, and, starting in 1967-68, at the Southern Alberta Institute of Technology. The Ryerson course is one of the options of the business administration program and is three years in length, while the courses at the other institutes are of two years' duration.

These courses include such subjects as personnel, front office procedure, accounting, purchasing, preparation and serving of food and beverages, advertising and promotion, and human relations. At the British Columbia Institute of Technology, students gain two months of practical experience in a hotel, motel, or restaurant between the first and second years of the course.

Graduates of these courses may find employment with hotels and motels (individual or chains), with restaurants, private clubs, airline catering services, travel agencies, and university or hospital food services or they may wish to take their place in family businesses.

Out of the rapid technological advances in industry and business over the last two decades has grown the need for those who can measure and interpret data relevant to production problems. Individuals with a high degree of analytical ability trained in modern methods of mathematical and statistical applications and able to apply modern data processing techniques are in heavy demand by all types of businesses and industries.

The course in industrial management was pioneered at Mohawk College in Hamilton and will also be offered at Centennial College in Scarborough. A related course in industrial production is given at the Northern Alberta Institute of Technology in Edmonton and at l'Institut de technologie de Vaudreuil in Quebec. These courses provide students with a practical background in the science of work measurement, production planning, data processing, operations research, and industrial organization, coupled with a general background in the other disciplines. Studies involving the nature of materials, their chemical and mechanical characteristics, machine shop, tool design, and elements of electrical and electronic principles provide necessary tools for the analyst. In addition, emphasis is placed on studies in English or French and on developing skills of both verbal and written communications.

Students entering the course should have an aptitude for mathematics and a desire to work with people and ideas.

From the first graduating class of 12 in 1964 the industrial management course at Mohawk College has grown at a steady pace to 30 in 1967. More than 40 companies offered more than 100 jobs to these 30 students. Forty-eight students are expected to graduate in 1968.

Salaries for the industrial management graduate have averaged slightly higher than other technologies. In 1967 they ranged from \$460 to \$525 depending on the nature and location of the position as well as the previous experience of the individual. The average is approximately \$490.

Graduates are employed in a broad range of analytical and management positions in organizations varying from heavy steel

Industrial Management and Production Technology

production to hospitals. Positions in industrial engineering offer a wide variety of jobs in methods study, works simplification, work standards, wage incentives, project planning, cost analysis, and the like. Production planning and scheduling, productivity analysis, quality control, system studies, computer programming, purchasing, and sales are other areas in which graduates are presently employed. In addition, an increasing demand has developed for graduates for positions in production supervision. Often graduates are offered training courses ranging from three months to one year prior to choosing the particular field in which they wish to work in the organization.

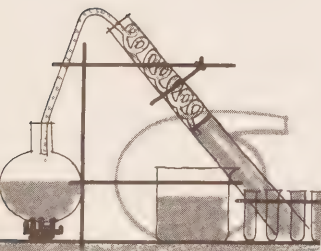
Marketing and Retailing

Several technological institutes offer specialization or separate courses in the area of marketing and retailing. The Saskatchewan Technical Institute, for example, gives a two-year course in retailing which is geared to careers in selling and sales management, buying, advertising, display, stock control, credit, and small store management.

The Southern Alberta Institute of Technology also offers a separate course in merchandising administration. This course trains students for employment in department, chain, and specialty stores, wholesale houses, manufacturing and financial organizations, and others.

Ryerson, Centennial College, and perhaps others in Ontario offer options of their business administration course in both marketing management and retail administration. St. Clair College and others in Ontario offer a marketing option in the third year of their business administration program.

CHEMICAL TECHNOLOGY



With the rapid expansion of the chemical industry in Canada in the last ten years and with the growing importance which chemistry is playing in almost all manufacturing industries, there is an increasing demand for chemical technologists. Although the increase in the number of graduates in 1968 over the previous year is expected to be about 55 per cent, this supply will still be insufficient.

There are currently 15 institutes of technology producing graduates in chemical technology. Besides these, a number of the new colleges of applied arts and technology in Ontario may offer this program.

In the Maritimes, the institutes of technology at Moncton and Saint John offer two-year courses in industrial chemistry. In the second year, the student may choose either the laboratory chemistry or plant process option.

The existing programs in Ontario are offered at Ryerson Polytechnical Institute and at Algonquin, Northern Ontario, and St. Clair Colleges of Applied Arts and Technology. These courses provide a general background in the first year in fields such as physics, chemistry, electricity, and instrumentation, and emphasize in the last two years the basic principles of various branches of chemistry — analytical, organic, inorganic, industrial, and physical.

St. Clair College expects to graduate 36 chemical technologists in 1968, the same number as was produced in 1967 by the Western Ontario Institute of Technology which it incorporates. Algonquin College predicts a graduating class of 43 in 1968 which is more

than double the number of 1967 chemical graduates from the former Eastern Ontario Institute of Technology. Northern College expects its first chemical graduates in 1968 to number 19. Ryerson's predicted class for 1968 is about 100 graduates, an increase over 1967 of about 63 per cent. The Manitoba Institute of Technology expects 15 chemical technology graduates in 1968, slightly more than in 1967.

The Northern Alberta Institute of Technology reports that it could increase enrolment in chemical technology to 88 per year and is expecting an increase in its graduating class accordingly. The two-year course offers a research option during the second year. The curriculum includes very up-to-date theoretical and practical treatments on chemical analysis including gas chromatography, spectroscopy, and polarography; inorganic and organic synthetic preparations; high vacuum techniques; biochemistry; glass blowing; and physical chemistry.

The Southern Alberta Institute of Technology offers a course in chemical technology with three specializations available in the second year — chemical research, biochemistry, and chemical operations.

The British Columbia Institute of Technology also offers a two-year course in chemical technology which provides instruction to students wishing to enter the process industries, either as operating or laboratory personnel. In the second year, the curriculum provides considerable analytical laboratory practice together with such production training as work study, unit operations, and instrumentation.

Five of the institutes of technology in Quebec offer courses in chemical technology: Hull, Shawinigan, Jonquière, Laval, and Tracy. These courses are three years in length and two options are available — analysis and procedures. During the third year, the student must submit a research paper on one of the numerous branches of the chemical industry. The total 1968 graduating class is expected to number nearly 250 which represents an increase of 56 per cent over 1967.

The employment opportunities available to the graduate in chemical technology are numerous and salary rates have risen to about \$476 per month for 1967 graduates. In addition to entering chemical production proper, the technologist may find employment in the fields of engineering, sales, or research.

The expansion of the construction industry combined with the shortage of civil engineers means that attractive opportunities are available for graduates in civil and structural technology.

Nearly every institute of technology offers a course in civil, structural, or construction technology, sometimes with options in specialized fields. These courses are normally three years in length in Ontario and Quebec and two years elsewhere, except at the Southern Alberta Institute of Technology which is also three years. The Ryerson Polytechnical Institute offers the Civil Technology Course on the Tri-Semester System.

The basic curriculum of most of these courses consists of a theoretical training in mathematics and science as a background to such subjects as surveying principles, highway design and construction, bridge and building construction, drafting, municipal services, structural design, laboratory techniques, and computing.

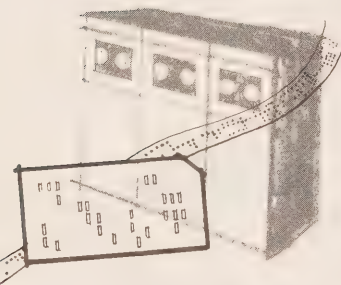
CIVIL AND STRUCTURAL TECHNOLOGY

In most cases, this training takes the form of both lectures and laboratory work.

This basic instruction qualifies the graduate for a host of employment opportunities. These may be with consulting engineering firms, contractors and builders, fabricators, railways, suppliers of construction materials, and municipal, provincial, and the federal governments. They may be engaged in the design and construction of highways, railways, airports, seaports, communications and power development projects, buildings and bridges, municipal streets, and water and sewage systems. Some of the common occupations of civil and structural technologists are building and construction inspectors of many kinds; foremen, supervisors, and engineering assistants; laboratory technicians in materials and soils testing; and salesmen and managers in building materials and equipment.

Starting salaries for 1967 civil and structural graduates averaged about \$460 per month, a substantial rise over those paid in 1966. The number of graduates in this discipline in 1967 was about 300 with an anticipated 550 in 1968.

COMPUTER TECHNOLOGY



The vast development of the digital computer over the past several years caused the so-called second industrial revolution. Almost all fields of industry are affected by the computer. It is now commonly found in banks, libraries, accounting establishments, airline ticket reservation services, meteorological bureaus, and many others. Several transportation systems at EXPO 67 in Montreal were, for example, controlled by digital computers.

Specialists in this field are essential for the handling of the complex computers. It is for this reason that the Southern Alberta Institute of Technology offers a two-year course in computer technology. This course includes the study of mathematics, physics, business administration, English, sociology, statistics, and economics, as well as offering the digital computer course which has to do with the handling of commercial and administrative information.

Computer technology is also offered at the British Columbia Institute of Technology and at the Ryerson Polytechnical Institute as an option in business administration over a two-year period.

Mohawk College of Applied Arts and Technology reports that the course in control systems technology, which is unique to that institution, is in essence a study in the control of electronic and electrical instruments, including the electronic digital computer.

The student interested in this field must have ability in analysis and mathematics and must be able to develop a logical reasoning along with a keen sense for detail. The majority of these graduates find employment in retail and wholesale selling, in industry, and in the public service.

Starting salaries offered to computer technology graduates in the spring of 1967, reached an average of \$475 per month.

DENTAL TECHNOLOGY

The demand for dental services has increased considerably in recent years, and the need for dental technologists and assistants is making itself increasingly felt. With the current emphasis on the preventive as well as the curative aspect of dentistry and with the increasing number of people who require false teeth, dental technologists and assistants should have no difficulty in finding regular and interesting employment.

The Northern Alberta Institute of Technology and the Ryerson Polytechnical Institute offer a two-year course in dental laboratory technology. Northern Alberta and Vancouver City College also give a one-year course in dental assistance. Quebec plans to establish a two-or three-year course in this area following a recommendation of the Parent Commission.

The dental laboratory technology course at Northern Alberta provides the student with a solid theoretical basis during the first year and with a good deal of practical work in dental mechanics in the second year of the program.

The National Association of Dental Laboratory Technologists defines such a person as one who makes, reproduces, and repairs false teeth according to a dentist's prescription. He must have a precise knowledge of false teeth techniques including teeth, gums, bridges, and all other dental and orthodontic equipment. He must also work with gold, ceramics, chromium, and other metal alloys used in dentistry. After graduation he may be employed in a laboratory, in a dentist's office, or in his own firm.

The dental assistant curriculum centres on providing its students with the manual dexterity, the technical knowledge, and the clinical experience they require. The assistant's functions vary from aiding the dentist directly in his work to administering the office. The graduate learns to handle and sterilize the dentist's tools, to prepare his equipment, to develop X-rays, and to maintain files on patients.

Most graduates in dental assistance find employment in dentist's offices, while others work in hospitals, dental clinics, or public health services. At the beginning of his career the dental assistant ordinarily receives a modest salary but is accorded considerable increases as he acquires experience.

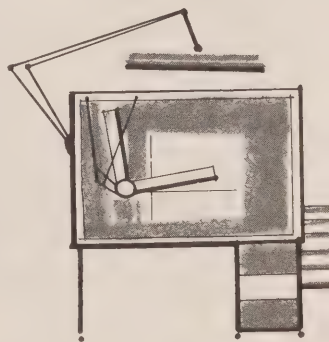
Drafting technology, as a distinct discipline, is offered at the Saskatchewan Technical Institute, the Southern and Northern Alberta Institutes of Technology, the Manitoba Institute of Technology, the five established institutes in Ontario, and also at the Quebec institutes of Chicoutimi, Jonquière, Shawinigan, Trois-Rivières, and Sept-Îles.

At the two Alberta institutes, two paths are open to the student who is planning a career in drafting technology. One can choose a three-year course after Grade 11 or a two-year course after Grade 12. After two years' experience, the graduate may be accepted by the Alberta Society of Engineering Technologists.

The course in drafting technology is of three years' duration in the province of Quebec and of two years' duration in Ontario, Manitoba, and Saskatchewan. Apart from options, the course includes mathematics, English, and physics. The number of graduates expected to receive their diplomas in 1968 is 173, double the 1967 figure.

The fields of employment open to qualified drafting technologists are extremely varied. Upon receiving his diploma, the student can specialize in mechanical, tool design, electrical, electronic, topographic, aeronautical, or nautical drafting. The institutes offer a wide variety of courses which provide a general drafting background. After having gained a certain amount of competence in drafting, and having acquired a basic grounding

DRAFTING TECHNOLOGY





in mathematics and physics, drafting technologists are trained on the job, in order to adapt their general knowledge to the employer's requirements. They follow a program of instruction of which the duration can vary from three to four years, before they can be classified as competent drafting technologists in a field of their own choosing.

Graduates in drafting technology are often employed as assistants to scientists, engineers, contractors, architects, and in almost all fields of industry. However, certain graduates, especially those interested in cartographic drawing, can find interesting work in the government service.

Starting salaries for 1967 graduates varied between \$400 and \$420 per month.

Due to the large expansion in the electrical industries, there is an increasing demand for the electrical technologist. For several years the number of vacant positions has surpassed the number of graduates, making the training of many more specialists in this discipline essential.

The institutes in Canada offering the course in electrical technology number twenty-two. The duration of the course varies between two and three years depending on where it is offered. Apart from his specialization in many electrical fields, the student usually receives courses in mathematics, physics, English, and industrial design.

The projected total graduation in this discipline in 1968 is 839, which is an increase of 26 per cent over 1967. Even this number will be insufficient to fill the demand for personnel in this field.

The function of the graduate in electrical technology is to install, utilize, and maintain, in good running condition, apparatus used in the transmission, production, and utilization of electrical energy for scientific, industrial, and commercial purposes.

A wide variety of employment is offered to the graduate in electrical technology. He can gain promotion to lucrative and interesting positions in several branches of the electrical industry, including the manufacture of electrical apparatus, production control, maintenance of electrical appliances, market planning, testing and inspection, estimation, installation, and operation. Others enter the sales and service of electrical appliances. A large number of graduates find positions with transmission services, such as in the functioning of telephone, radio, and television systems. Hydro-electric power plants, engineering offices, and research laboratories are constantly seeking the services of competent electrical technologists.

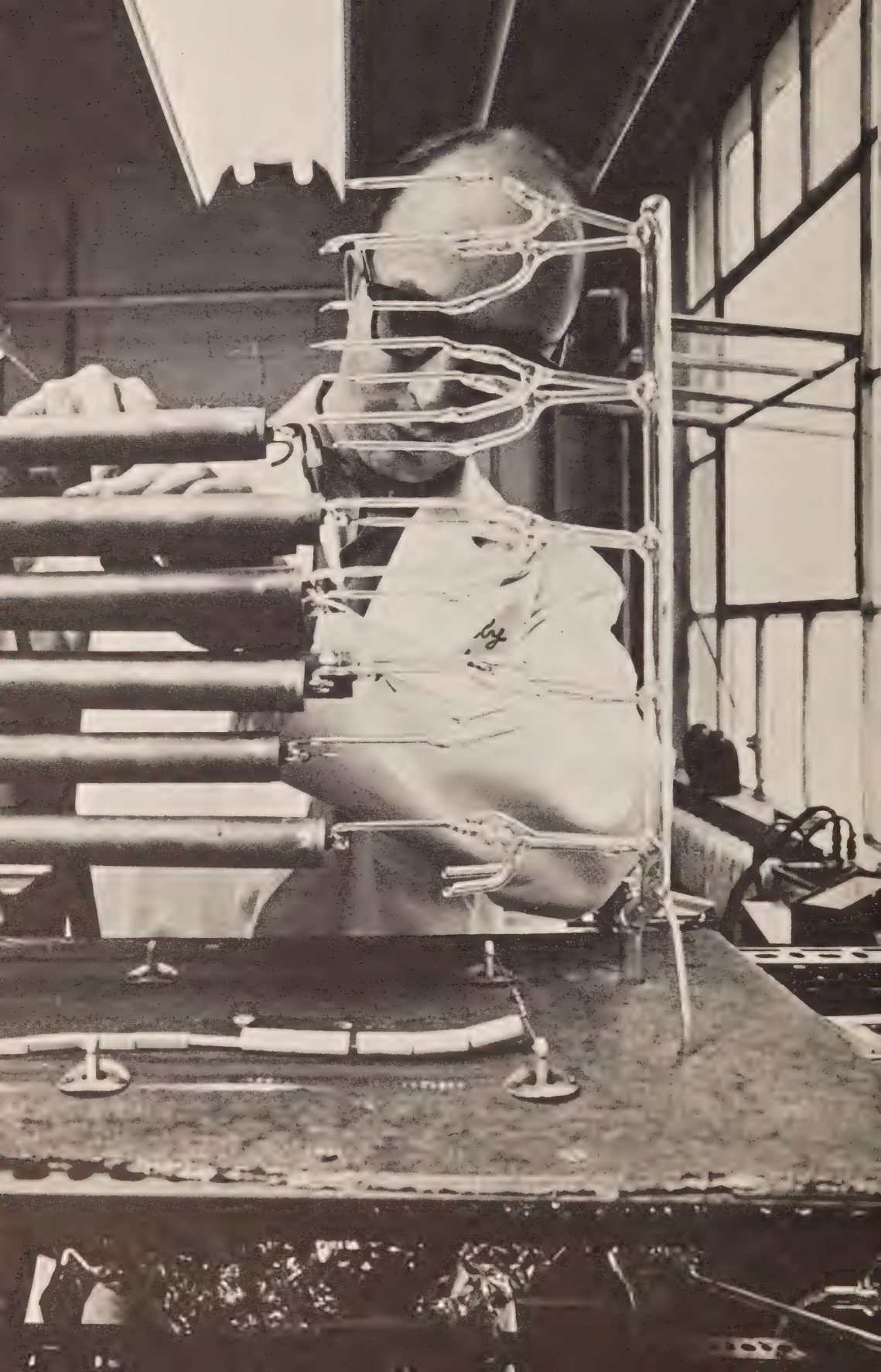
The average starting salary for graduates in electrical technology in 1967 was \$460 per month.

The rapid expansion of the electronics industry has obliged the engineer to limit himself, because of lack of time, to the theoretical problems and to quality control. Because of this, a greater need has arisen for the specialist in electronic technology who can implement the engineer's plans on a practical basis.

Electronic technology is offered at 24 institutes in Canada. In the spring of 1968, 1,179 students are expected to receive their diplomas in electronic technology, which represents an increase of

ELECTRICAL TECHNOLOGY

ELECTRONIC TECHNOLOGY



50 per cent over the figure in 1967. Though the increase is significant, the demand for electronic specialists is quite high. The graduates of this discipline should not encounter any difficulty in finding interesting and remunerative employment.

The duration of the course is either two or three years, depending on the institute. Several institutes, Ryerson, Vaudreuil, Trois-Rivières, and Quebec, offer a course which combines the electronics and electrical fields in a three-year program.

The Southern Alberta Institute of Technology reports that an option in telecommunications will be offered in September 1967, in order to train qualified technologists in the telephone and telegraph fields.

The student interested in electronics technology must possess ability in subjects such as mathematics and physics.

Several fields in electronics are open to the graduate: he can concentrate on the manufacture and testing of recording apparatus, of telecommunications, of computers, of detection apparatus, or of measuring instruments. The graduate can also find interesting work in engineering research and laboratories, and in the research departments of the federal government such as the Defence Research Board and the National Research Council.

Starting salaries for the graduate of 1967 averaged about \$460 per month.

The role of the designer is becoming more clearly defined and more apparent to those in need of his services, and a very real need exists to satisfy and increase appreciation of aesthetic values generally according to the Applied Arts Department of Ryerson Polytechnical Institute. Consequently, the opportunities for graduates in various facets of fine arts are increasing.

A variety of courses at the post-secondary level in fine arts subjects is available in Canada. These courses are offered principally at four institutions: the Southern Alberta Institute of Technology, Ryerson Polytechnical Institute, l'Ecole des Beaux Arts, and l'Institut des arts appliqués.

The Southern Alberta Institute of Technology offers four-year courses in the following fields: advertising art, applied arts and general crafts, fine art, fine art sculpture, and pottery and ceramics. Graduates may be employed in sales promotion, as part-time or full-time art teachers, or they may become artists.

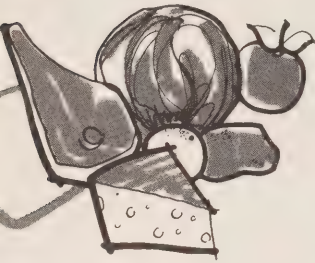
Ryerson offers a three-year course in furniture and interior design. Graduates may be employed in such capacities as designers of store and display fixtures and layouts, of offices, of custom furniture, and of residential and commercial interiors, and as interior designers in architectural firms.

L'Ecole des Beaux Arts in Montreal offers a four-year course with specialization in painting, sculpture, graphic communication (advertising art), engraving, and integrated arts. To those students who have graduated from the school and who wish to enter the teaching profession, the school offers a special artistic course for teachers.

In addition to these, Vancouver City College also offers a course in art and merchandising which trains students both in certain aspects of commercial art and in the field of retail sales and other commercial ventures.

FINE ARTS

FOOD TECHNOLOGY



With a substantial expansion in hotel, hospital, university residence, nursing home, and senior citizen facilities, coupled with a stronger emphasis on research, the food sector of the economy is undergoing continuous change. This has resulted in a constantly rising demand for graduates of food technology. Thus, although there is a predicted increase in the size of the 1968 graduating class of over 50 per cent, the employment and advancement opportunities will still be very good and starting salaries in 1967 averaged approximately \$400 per month.

The student wishing to enter any one of the various institutes offering food technology is generally required to have a high school graduation diploma or its equivalent, with a concentration in such courses as chemistry and biology. For simplification, the food technology field can be broken down into several particular programs of study.

One area of concentration is the food service option. The institutes which stress this area of food technology are the Northern and Southern Alberta Institutes of Technology, the Saskatchewan Technical Institute, the Ryerson Polytechnical Institute, and Centennial College. Courses are two years in length except at Ryerson where the course is of three years' duration.

The student usually spends approximately half of his time in practical training; the other half in the classroom and laboratory studying such subjects as nutrition, commercial food preparation, food purchasing, institutional and personnel management, sanitation and health, business mathematics and accounting, and food service for various types of institutions. The graduate of this course usually finds employment as an assistant to a registered dietitian in large establishments, or assumes the responsibility for food service operations in smaller hospitals or commercial or industrial organizations. Demand in this area is acute, and the graduate should have little difficulty in finding a rewarding position.

The course offered at Vancouver City College also emphasizes dietary and food preparation and therapeutic nutrition, as well as such academic courses as psychology, sociology, and personnel management.

A second major field in food technology is the food processing option which is offered at the British Columbia Institute of Technology, the institute of technology at St. Hyacinthe, and the College of Fisheries in St. John's. The student is given a thorough grounding in such basic sciences as biology, analytical and organic chemistry, biochemistry, and microbiology before passing on to the more specialized courses which may include the production of fruits and vegetables, food microbiology and hygiene, food preservation, canning, freezing and drying, quality control, marketing legislation, and food law. The College of Fisheries applies these courses particularly to marine products. The graduate of this option can choose from a variety of positions including marketing; quality control in food plants; the processing of food products in packing houses, freezing and drying plants, breweries, and distilleries; performing physical and bacteriological tests on food and food products; grading food products, and governmental inspection of food and food products.

A third area of food technology, the food production option, is being offered for the first time in the fall of 1967 at the British Columbia Institute of Technology. It focuses on such specialized



courses as crop, animal, and soil technologies, and the analytical, mechanical, and business aspects of modern agricultural production. The student will concentrate on such courses as genetics, nutrition, pathology, chemistry, microbiology, and statistics in preparation for such occupations as laboratory control, the marketing of agricultural chemicals, feeds and fertilizers, food manufacturing operations, or governmental inspection services.

With such a wide variety of courses available, the student of food technology can expect limitless opportunities for a rewarding career in this basic and important industry.

In the area of home economics, Ryerson Polytechnical Institute and Centennial College of Applied Arts and Technology offer options in the second and third years in fashion, in home economics teaching, and in pre-school education besides the food administration or service option. The fashion option provides the student with a professional competence in fashion, textile, and garment design from which the graduate may enter business as a buyer, stylist, or consultant, or, with a year of experience and one year at the Ontario College of Education, may enter the teaching profession. The graduate in food administration may also become a teacher in the same manner, or instead, take the teaching option in the third year at Ryerson (or go to Teacher's College from Centennial College) and go directly into teaching.

FORESTRY AND FOREST PRODUCTS TECHNOLOGY



In 1967 the four institutes offering diplomas in forestry and forest products technology—British Columbia Institute of Technology, Northern Alberta Institute of Technology, Lakehead University, and the College of Trades and Technology at St. John's produced 95 graduates. An increase over this number of approximately 50 per cent is anticipated in 1968.

However, as in previous years, the supply of graduates in forestry and forest products technology will not meet the expected requirements, which will again ensure very favourable employment opportunities for these graduates. Indeed the Canadian Institute of Forestry estimates at least two positions will be open to each qualified graduate. As a result of this strong demand salaries for these positions will remain very competitive. The average starting salary for 1967 graduates was in the range of \$415-\$420 per month, although starting salaries in the Lakehead region have been reported as high as \$450.

The entrance requirement to all of the institutes granting the diploma in forestry technology is a high school graduation diploma or its equivalent. The basic curriculum requires a strong background in mathematics, science, and English. These courses vary in content from such technical skills as drafting, surveying, and cruising methods, to such academic subjects as silviculture, entomology, pathology, botany, zoology, and dendrology. All of the institutes provide for some compulsory period of field operations and strongly advise students to obtain related summer experience.

The course duration in forestry and forest products technology is two years and is intended to be terminal. However, Lakehead University notes that its outstanding diploma graduates can obtain an advanced standing in a degree course in forestry.

The British Columbia Institute of Technology also offers a two-year option of forest products technology, which is designed to provide industry with graduates qualified in manufacturing and

plant operations, quality control, and sales. This course, in addition to providing the student with the basic skills, emphasizes such specialized areas as the wood option which stresses the most economical methods in collecting raw timber and converting it into such commercial products as lumber, particle board, and plywood. Another area of concentration in this course is the pulp and paper option which is concerned mainly with the theory and practice of mechanical, semi-mechanical, and chemical pulping and the conversion of pulp into such useful products as newsprint, paper, and textiles.

In Quebec, the institute of technology at Chicoutimi offers a three-year course in forestry technology and the Institut de papeterie at Trois-Rivières gives a course in pulp and paper technology of the same duration.

The Saskatchewan Technical Institute at Saskatoon offers a related but more general course of renewable resources technology which is designed to provide students with the necessary skills and related knowledge required to equip them for employment as conservation officers, fish, forestry, and wildlife technicians, or park wardens. This course of study is the only one of its kind in Canada, stressing fisheries, wildlife, parks, and outdoor recreation along with other academic and technical subjects.

The demand for well-trained graduates in this discipline comes from a variety of sources. The College of Trades and Technology at St. John's reports an urgent need for people in such areas as pulp and paper operations, research, quality control, product sales, sealing production, and reforestation programs. Other institutes point out that with new principles and techniques being applied in industry and with the increasing importance of the lumber industry to the national economy, the demand for highly competent men in this field should continue for some time.

New graduates in forestry technology have a wide variety of employment opportunities available both in industry and government. Well-trained technologists are required in the protection of forests from fires, insect infestation, and disease attacks as well as in the supervision of regeneration surveys, planting, seeding, and nursing operations. These skills can be applied in such positions as conservation officers, forestry technicians with entomological and pathological surveys, forest rangers, field supervisors in reforestation programs, and in research. Graduates will also find numerous positions available with paper mills and organizations manufacturing products for the building industry where the skills acquired in forest products technology will be most useful. Finally the graduate may choose a position in the field or in logging where he will prepare and lay out setting plans and cutting boundaries; mark timber and survey and construct roads; or in the field of cruising and stand management where he will cruise timber stands for inventory and logging development.

Natural gas constitutes a large and increasing part of the energy utilized in Canada. Factories operating solely with natural gas are numerous, and a wide range of interesting employment opportunities are offered to the qualified gas and oil technologist.

Four institutes offer the course in Canada: the Northern and Southern Alberta Institutes of Technology, the British Columbia Institute of Technology, and the Ryerson Polytechnical Institute.

GAS, OIL, AND EXPLORATION TECHNOLOGY



The Ryerson course in natural gas technology is offered as an option in chemical technology.

The Southern Alberta Institute of Technology places emphasis on the geological aspects of oil technology in the hope of improving the oil industry through its engineering and geological graduates.

The Northern Alberta Institute of Technology offers a course on natural gas technology with emphasis on such subjects as chemistry and the analysis of its derivatives.

The British Columbia Institute of Technology, on the other hand, offers an option in natural gas technology, which assures the student a training in the transport and utilization of natural gas in the industrial and domestic fields. Apart from this, the oil technology option will assure the student a grounding in the transportation and utilization of oil in the modern automatic refineries.

A course in exploration technology is given at the Northern Alberta Institute of Technology which is aimed at the formation of specialists in the technique of locating mineral deposits on which a large portion of our economy depends.

The gas and oil technologist should be expected to work on core analysis of oil wells, on the sales and service of equipment used in the mill, or in the field as well as in transmission which includes pumping stations and pipeline maintenance. Most of these positions offer the graduate outdoor work, but there are also many indoor positions.

Average starting salaries offered to technologists in the gas and exploration disciplines reached \$475 per month in 1967.

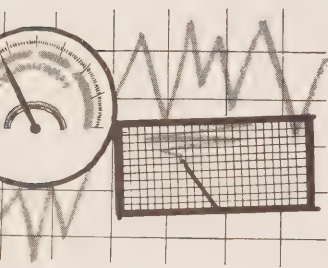
The graphic arts are the methods or processes of printing images upon paper or other surfaces. These methods, traditionally manual and mechanical, are now photomechanical, chemical, electrostatic, and electronic in nature. These advances have greatly increased the demand for skilled and talented people in the graphic arts industry.

Because of the increasingly complex and highly automated printing equipment in use today, there is an ever growing need for technological graduates in all areas of printing management and production. Printing technology is moving so quickly that this once craft-oriented industry now requires graduates in mathematics, physics, chemistry, electronics, data processing and basic systems concepts, photographic and photo-reproductive arts. It continues to need people who are well trained in lithography, letterpress, paper, inks and machinery as well as graduates from courses relating to business management, estimating, accounting, statistics, money and banking.

Two courses designed to provide such graduates are at Ryerson Polytechnical Institute (three years) and the Southern Alberta Institute of Technology (two years). The printing management course at Ryerson is business-oriented and includes courses in accounting, mathematics, psychology, and business law. The new graphic arts course at Southern Alberta as well emphasizes business and communication skills required in the managerial and administrative areas of production, sales, purchasing, finance, and control. In addition, both courses provide students with a broad understanding of the printing industry in particular including printing and photographic processes and materials.

GRAPHIC ARTS

INSTRUMENTATION AND CONTROL TECHNOLOGY



Other courses which are more technology-oriented are offered at l'Institut des arts graphiques in Montreal (three years), l'Ecole des Beaux Arts in Montreal (four years), l'Institut de technologie de Quebec (three years), and Vancouver City College (two years).

Both the business- and technology-oriented graphic arts graduate can choose among a wide array of employment opportunities. These include commercial printing, lithography, silk screen companies, newspapers, public relations and advertising agencies, printing equipment distributors, industrial advertising departments, and industrial and governmental printing plants.

A related field, photographic arts, is also expanding rapidly and creating a demand for qualified graduates. Ryerson is the only institute to give a special course in photographic arts. It is three years in length and includes training in the various phases of photography—industrial, commercial, press, illustrative, fashion portraiture, colour, and motion picture.

Instrumentation and control technology is mainly concerned with the use of industrial instruments. These instruments are used in such areas as steel, gas and oil, and chemical production; in the transmission and recording of information; and in the measuring of pressure and temperature.

Six Canadian technological institutes offer the course in instrumentation and control technology, the Laval, Lauzon, Saint John, Northern Alberta, and British Columbia Institutes of Technology, and the Ryerson Polytechnical Institute. The course is of two or three years' duration depending on the particular institute, and includes studies in mathematics, physics, English, electricity, electronics, general chemistry, maintenance and functioning of instruments, and measuring procedures.

The graduate in instrumentation and control technology will usually function in the installing and maintenance of measuring instruments. The instruments make use of electronic, pneumatic, and hydraulic principles; this requires the technologist to have a good understanding of the theoretical and practical elements of his work in order to enable him to communicate intelligently with engineers.

The Northern Alberta Institute of Technology reports a brisk demand for graduates in this field, and also predicts a similar demand for the next ten years. Employment opportunities are twice as numerous as the number of available graduates.

Employment opportunities run the gamut among installation of equipment, testing procedures, trouble-shooting in operations, supervising, and the creation of new instruments and methods. There also are interesting openings for the graduate in manufacturing concerns and laboratories which make use of special instruments of measurement requiring constant surveillance on the part of qualified technologists.

The 1967 graduate in instrumentation and control technology received an average monthly salary of \$420.

LIBRARY TECHNOLOGY

A world in which knowledge is exploding and in which printed matter is an increasingly important source of information requires the most modern libraries and the most up-to-date library resources. To help ease the burden on professional librarians, several technological institutes have established library assistant and



library technology courses varying in length from ten months to three years.

In this field there are two established and six new courses offered in Canada, three in Quebec and five elsewhere. The latter five generally include a study of English language and literature, Canadian and/or world history, stenography, and sociology in addition to the more professional courses such as classification, cataloguing, and other library services.

The Manitoba Institute of Technology was the first to offer a course for library assistants. The ten-month program is divided into two parts: the first includes theoretical courses in basic library techniques; the second, more general subjects, in addition to a six-week training period divided among three libraries of different types in which the student acquires practical experience.

The Technology Division of Lakehead University offers a two-year course in library technology and will produce its first graduates in the spring of 1968. Students in this course may study a foreign language in addition to the subjects mentioned above. Ryerson will begin a two-year course in library arts in 1967 and St. Clair College (formerly Western Ontario Institute of Technology), a one-year library technician course.

The shortage of library technologists in Western Canada will be offset by the new course in library arts at the Southern Alberta Institute of Technology. It is also a two-year course, the last semester of which consists of a ten-week in-service training period in a recognized library.

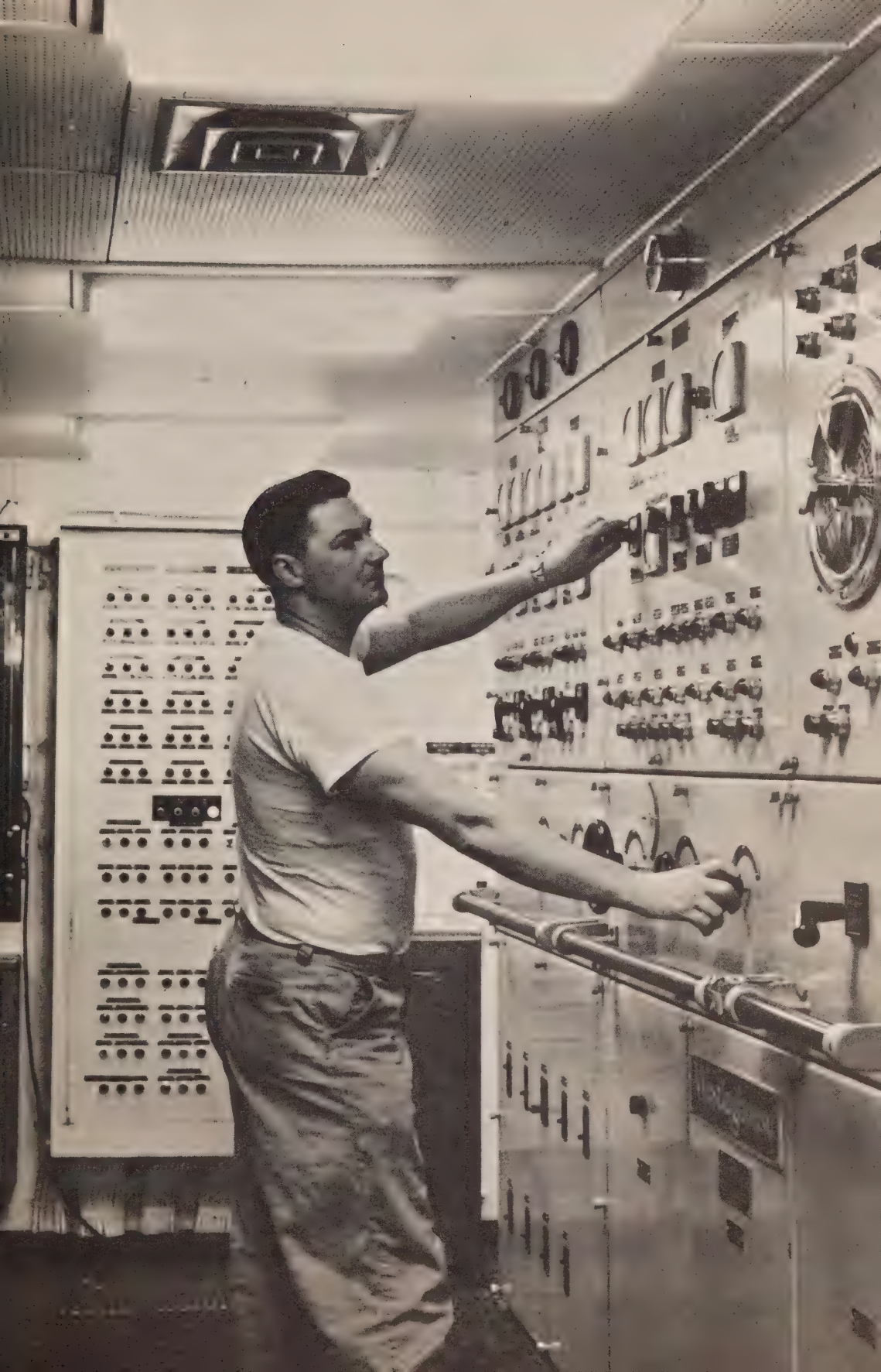
In Quebec, the three technological institutes which offer a three-year course in library technology are Jonquière, Sherbrooke, and Trois-Rivières. One fifteen-week session is reserved for a practical training period in a school or municipal library under the supervision of a professional librarian. These courses, given in French, emphasize especially the French language and French-Canadian literature.

Library technology is an interesting and a growing field. Graduates of this course have the advantage of working with congenial and stimulating people, ideas, and books, and an opportunity to continue their education through reading. They may be employed in public, municipal, school, or university libraries, or in private and industrial libraries of various kinds. With the present growth of libraries everywhere in Canada, graduates can be assured of good starting salaries.

MARINE TECHNOLOGY

There are two institutes of technology in Canada which specialize in disciplines related to the marine and fishing industries, the College of Fisheries, Navigation, Marine Engineering, and Electronics in St. John's, Newfoundland, and the Institut de Marine in Rimouski, Quebec.

The College of Fisheries services a very specific segment of the economy which is a most important industry in Newfoundland. It offers three-year technology courses in electrical engineering and food technology and three and one-half year courses in mechanical engineering, nautical science, and naval architecture and ship-building. All courses except that of electrical engineering are marine-oriented. For example, in mechanical engineering the student may choose between marine engineering and fish plant engineering. Five graduates in this field are expected in 1968.



The nautical science course includes such subjects as physics, chemistry, ichthyology, marine geography, maritime law, and other navigational, fishing, and seamanship subjects. Graduates of this course may become captains and mates of modern deep-sea fishing vessels or of the merchant marine, or they may become fishing gear technologists or officers in the Canadian Coast Guard. Five graduates are expected in 1968.

Career prospects for graduates of the naval architecture and shipbuilding course are excellent due to the rapid expansion in the building of fishing and government vessels. The first two students in this course will graduate in 1968. The College also offers post-diploma courses in several fields.

The Institut de Marine gives three courses, navigation and radio-communication which are both two years in length, and marine mechanics which is of three years' duration. The navigation course, which will have 21 graduates in 1968, is intended for those who wish to become bridge officers and pilots, while the mechanics course, which had four graduates in 1967 and expects six in 1968, trains mechanical officers to ensure the proper functioning of marine machines and mechanical and electrical apparatus. The radiocommunication course produces graduates able to obtain the Department of Transport radio operator certificate.

MECHANICAL TECHNOLOGY

Mechanical technology encompasses an extremely broad range of industrial activities involving design, construction, installation, and use of machines and mechanical devices of all types as well as the manufacture of goods in general. Due to the continually expanding primary and secondary industries and research establishments in Canada, it follows not only that the demand for the mechanical technologist will be substantial, but also that the qualified graduate in this field can expect challenging and rewarding employment in a wide range of interesting occupations.

With such a strong demand from this wide variety of sources, there is little likelihood that the approximately 500 graduates in 1967 (representing an increase of over 60 per cent from last year) will encounter any difficulty in finding excellent career opportunities. Thus the reported salary range of \$450-485 per month bears out industry's forecast that demand will once again outstrip the supply of mechanical technologists.

Twelve institutes offer a diploma in this course, basically all of which demand a high school graduation diploma or its equivalent for admission. The duration of the course ranges from two years in the Atlantic and Western institutes to three years in the Ontario and Quebec schools. All of the institutes require and give a thorough grounding in such basic courses as English, mathematics, chemistry, physics, and energy and force systems, before branching into the specialized courses of more practical and direct application such as control systems, drafting, engineering materials, strength of materials, thermodynamics, machine design, and electricity.

Some schools feel a further degree of concentration is essential in such a wide discipline and therefore offer further specialization, usually in the final year, by channelling students into specialized options within mechanical technology. The British Columbia Institute of Technology and St. Clair College (formerly Western Ontario Institute of Technology) offer the student a choice in his final year between the production option and the design option.

The Manitoba Institute of Technology offers an architectural or engineering option. Ryerson provides three options—mechanical, production, and aeronautical. Finally the New Brunswick Institute of Technology offers a general mechanical option and a more specialized power plant option involving special training in the operation, design, construction, and maintenance of a steam generation plant.

Realizing that the manufacture of every item from automobiles to breakfast cereals is by mechanical means, one can safely state that the employment opportunities are too wide to be defined.

The British Columbia Institute of Technology reports that its graduates have found employment in consulting engineering offices as mechanical design draftsmen on machinery, stutwork, piping, power plants, and installation; in plant engineering offices, production departments, and estimating departments; in field installation and services, and in machinery sales. Other employment opportunities have been found, usually working under a professional engineer, as industrial radiographers, nuclear research assistants, electric utilities designers, or in positions working with gas turbines, electrical generators, lumber and pulp and paper machinery, and telephone apparatus.

More particularly, graduates in any of the production options may find excellent opportunities in large corporations performing such functions as time study and work standard programs, quality control plant layout, and material handling schemes and production control. The design option opens challenging positions in machine design, research and development, tool design, maintenance of complex equipment, air conditioning and refrigeration design, and technical sales. The aeronautical option equips the graduate to perform the skills of a mechanical technologist as applied to the aircraft industry.

Generally, the broad nature of the course makes the mechanical technologist of real value to all industry because of his adaptability to changing conditions. So wide is the scope of this field and so basic its services that the demand for these highly trained graduates is very great and is likely to remain so in the foreseeable future. Therefore with the rapid advances in automation creating new and varied positions, it would seem the future is brighter than ever for the graduate in mechanical technology.

Medical laboratory technology is a branch of medicine which is growing rapidly in importance although it is still a new and developing profession. Whether employed in a hospital or in a medical research or clinical laboratory, the medical laboratory technologist performs many scientific tests upon which pathologists and doctors depend in reaching their diagnoses and in treating illness.

Training programs in this field have been established in the laboratories of several large hospitals in co-operation with many institutes of technology. The College of Trades and Technology at St. John's offers a three-year course, while Ryerson and the Nova Scotia, Manitoba, Southern Alberta, Northern Alberta, and British Columbia Institutes of Technology offer a two-year course, the second year of which is spent in a hospital laboratory. Following this training, the student may take the examinations of the Canadian Association of Laboratory Technologists and if successful, he is registered as "R.T.", a qualification which is recognized not only

MEDICAL LABORATORY TECHNOLOGY



in Canada, but also in the United States, Great Britain, Australia, and several other countries.

The British Columbia Institute of Technology now offers a course in health technology which includes the following options: medical biology, health information, medical isotopes, medical laboratory, medical X-ray, nursing, and public health. Each of these options is taken over the two years of the course.

Medical technology training at the institute proper comprises a theoretical instruction in such subjects as mathematics, biochemistry, microbiology, hematology, histology, serology, laboratory instruments, human biology, physics, and chemistry. The practical period in the hospital laboratory includes routine and special analyses from which the student can develop his technical talents and his precision. For admission to a medical technology course, it is often necessary to have senior matriculation with specialization in such subjects as mathematics, chemistry, physics, and biology. About 375 graduates are expected in this field in 1968, a 68 per cent increase over the 1967 figure.

Medical laboratory technologists are employed in hospitals and clinics as well as in research, medical, veterinary, bacteriological, and pharmaceutical laboratories both within government service and in other laboratories requiring a similar training.

Starting salaries for 1967 graduates averaged about \$370 per month.

The science of radiology consists in using X-rays for diagnostic and therapeutic purposes in order to reveal the body structure in cases of illness or wounds. Although it is the doctor or surgeon who is directly in charge of the patient, their decisions are often based on the information obtained by the radiological or X-ray technician. This work goes on in almost every hospital and clinic in Canada. With the number of X-rays having increased 25 per cent in the past 12 years, specialists in this field are in increasing demand.

Five technological institutes offer courses in medical X-ray technology: the Newfoundland College of Trades and Technology, St. John's; l'Institut de technologie Laval, Montreal; and the Manitoba, Northern Alberta, and British Columbia Institutes of Technology, at Winnipeg, Edmonton, and Burnaby, respectively. Nearly 300 graduates are expected in this field in 1968, 60 per cent of them from the Laval institute.

These institutes have established co-operative programs with nearby hospitals. Students usually first take the theoretical part of their training, including sciences and radiological methods, at the institutes and then complete their studies in hospital laboratories. Here they are trained in the use of specialized equipment and techniques. At the end of this period students may write the certification examinations of the Canadian Society of Radiological Technicians. The successful candidate becomes registered as "R.T." and is qualified to work in diagnostic radiology.

Graduates may look forward to interesting employment in hospitals, clinics, and doctors' and surgeons' offices. As well as their application in medicine, X-rays are now being used to determine the structure of matter in many areas of industry. As this use continues to expand, so will opportunities for graduates in non-medical fields.

MEDICAL X-RAY TECHNOLOGY

METALLURGICAL AND MINING TECHNOLOGY

Salary rates for 1967 graduates were about \$370 per month.

A tremendous increase in Canadian mining production and rapid advances in technological methods during the past few years have resulted in Canada's becoming a major producer in the world market of such metals as iron, asbestos, lead, nickel, silver, and zinc. From Newfoundland to British Columbia, an unprecedented expansion is occurring in this sector of our economy. This has resulted in a high premium being placed on mining technologists.

However, although an increase in the graduation class of 70 per cent over the 1967 figure of approximately 100 graduates is expected, there will still exist a shortage of trained personnel in this expanding industry. As a result, starting salaries are in the neighbourhood of \$476 per month, with slightly higher salaries being reported in Northern Ontario and British Columbia.

The Newfoundland College of Trades and Technology at St. John's, Lakehead University, and the British Columbia Institute of Technology offer a two-year course in mining technology. The Provincial Institute of Mining at Haileybury offers a two-year certificate of standing program for senior engineering technicians as well as a three-year course leading to a graduation diploma. Mining technology at the Sherbrooke institute of technology and at the Quebec trade schools is a course of three years' duration, while Ryerson and the institute of technology at Trois-Rivières offer similar three-year programs in metallurgical technology. As a rule these institutes require a high school graduation diploma or its equivalent for entrance.

The student of mining and metallurgical technology will be given a thorough grounding in physics, mathematics, and chemistry to better prepare him for the more specialized subjects such as ore analysis and dressing, surveying, minerology-geology, electricity, mapping, and surface exploration which are of more direct application, thus facilitating his entry into industry.

The program of mining technology is designed to serve this major industry by preparing technologists to help search for new mineral deposits and operate new mines and to design and operate new mineral processing plants. Students who complete this program can expect to enter the industry as exploration assistants, mapping structure, logging drill core, or performing geophysical and geochemical tests in the field; as engineering assistants sampling developed rock, surveying in pits, or doing production control work in mines; or as test laboratory technicians, assayers, or junior operating staff in mineral processing plants. The Provincial Institute at Haileybury states that about one-half of its graduates are employed in engineering and surveying departments of mines as assistants to mining engineers. Other graduates from Haileybury have found their vocation in gold, silver, and base metal assay laboratories, in geological departments of mines, in milling plants and smelters, and in sales positions for companies which manufacture mining equipment and supplies. Finally, the graduate in this course is well equipped to engage in prospecting on his own.

The importance of the mineral industry to Canada provides unusual opportunities for employment in its technical occupations. Not only are the available opportunities extremely broad but also there appears to exist a serious shortage in all of them. Indeed the College of Trades and Technology at St. John's reports that the



PLASTICS TECHNOLOGY

number of trained technologists entering this profession is less than the number needed to replace those normally lost to the industry through retirement and death, let alone providing the technical personnel needed to meet the expansion in the industry. Thus the British Columbia Institute of Technology predicts that possibly within five years of graduation, the graduate might well achieve a supervisory rank as a party chief, shift boss, or foreman.

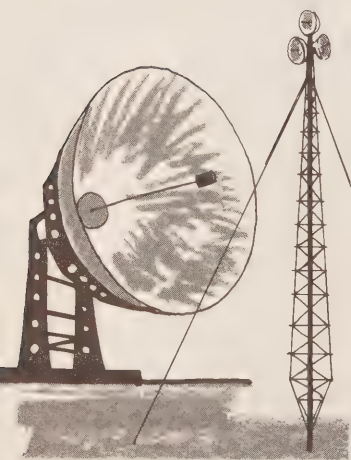
In recent years everything around us seems in one way or another to be made with plastics. Names such as polyethylene, vinyl, nylon, rayon, neoprene, latex paints, artificial rubber, and many others are familiar to us today.

With the rapid expansion of the plastics industry, the Northern Alberta Institute of Technology began a two-year course in plastics technology in September, 1966. This institute is the first to teach a regular course in this subject. The course includes basic chemistry involved in the manufacture and processing of plastics, extrusion, filament winding, moulding by injection, fusion and compression, and thermo and vacuum forming. The Northern Alberta Institute of Technology also offers a twelve-week evening course designed for persons already employed in the plastics industry.

Ryerson Polytechnical Institute offers a technician course in plastics and a polymer technology option in its chemical technology course.

The rapid expansion of the plastics and polymers industry has increased markedly the need for qualified personnel. Graduates should be able to find interesting employment in material and product development laboratories, basic material manufacture, technical services, sales, product design, production or engineering.

RADIO, TV AND JOURNALISM



The field of communication is ever expanding, creating large demands for qualified personnel. Communications—visual and audio—has become a complex medium reaching into every Canadian home. The growing scope of the industry necessitates the annual introduction into the field of newly-trained personnel. Previously these requirements were filled in part in the area of broadcasting by graduates of the radio and television arts offered at Ryerson, and of the broadcast communications course, production and technical, given at the British Columbia Institute of Technology. The Ryerson course is three years in length whereas the course at the British Columbia Institute is of two years' duration. However, in the fall of 1967 the Southern Alberta Institute of Technology and the Northern Alberta Institute of Technology began two-year courses in the radio and television arts and Vancouver City College also offers courses in journalism and theatre arts.

The course offered at the Southern Alberta Institute of Technology, reports the Director of Applied Arts, will prepare students to enter several major areas of these media: writing, sales, performing, and television—stage production. The two-year course will provide students with a program of studies which will combine theory with practical experience. Professional studios on campus will be available to students. This practical professional training will be based on thorough instruction in writing for radio and television, dramatic literature, history, marketing and economics, speech, advertising and public relations, basic design and execu-



tion of graphics, sets, properties, and lighting and sound for television and the stage. Special emphasis will be given to the visual aspects of communication in the television—stage option.

The Head of Radio and T.V. Arts at the Northern Alberta Institute of Technology reports that working in conjunction with their new division will be a permanent staff of television production personnel who will prepare videotape recordings of instructional programs for internal educational use. These programs are designed as teaching aids in areas where the instructor finds it difficult to illustrate specific points with his course material. The students in the radio and television arts course will be given practical experience in their chosen field by assisting in the production of videotape lectures. The Institute will also be working in conjunction with the Metropolitan Edmonton Educational Association which will be one of the first educational television stations to begin broadcasting in Canada.

At Ryerson the three-year radio and television arts course, through a blend of theory and practice, is designed to prepare the graduate for immediate employment in the broadcasting industry and also to develop a kind of flexibility required for adjustment in an era of automation and change. To facilitate the practice of radio arts, Ryerson operates a professional F.M. radio station, which broadcasts 20 hours a day with qualified students participating in all aspects of its work. The first year combines both radio and television arts and journalism in a common course providing a general orientation to the communication art emphasizing the effective use of the written and spoken word. Over the three-year period the field of study includes English, history, economics, psychology, radio production, radio writing, TV writing, TV and film production, geography, and political science. Radio and television arts students also take motion picture photography as a part of television production. The course is recognized by the broadcasting industry, and graduates are experiencing little difficulty in securing positions.

The two-year broadcast communications course offered at the British Columbia Institute of Technology is a realistic one, offering authentic on-the-job training and experience within the Institute, with students working in actual radio and television production for some months before they go into permanent employment. The course at the Institute is encouraged by broadcasters, and graduates are being easily absorbed by the industry.

F.M. radio is one area where qualified graduates are being called upon, particularly in programming because of the special nature and position of F.M. programming in relation to A.M. The unique situation of F.M. radio has arisen from the desire of the majority of private broadcasters, the Canadian Broadcasting Corporation, and the Board of Broadcast Governors to instill and maintain in F.M. programming a higher degree of quality than that in operation on A.M. radio. Therefore, the diverse problems in F.M. offer an exciting challenge to the graduate entering broadcasting.

Journalism is a three-year course at the Ryerson Polytechnical Institute. Candidates study such subjects as English, history, economics, psychology, sociology, geography, political science, and philosophy in conjunction with their journalism course. The Chairman of the Communication Department at Ryerson points

out that Ryerson is now proposing to offer further electives in magazine journalism, toward publishing a 48-page magazine; broadcast journalism, for Ryerson's radio station; and photo journalism, actual reporting assignments with the camera. Students also receive practical training operating a daily newspaper, on a staff-rotation basis, so that they become aware of all phases of the operation of a newspaper. Practical assignments involving diverse news sources are also a basic part of the training process. The Southern Alberta Institute of Technology also offers a two-year course in journalism administration. The objective of this course is to provide the student with background knowledge of the process involved in producing a newspaper or other publication and also to provide the student with a thorough grounding in the business aspects of journalism.

In response to the increasing leisure time available in modern life, a number of technological institutes have recently begun to offer courses in recreation technology. These include Southern Alberta Institute of Technology, St. Clair and Centennial Colleges of Applied Arts and Technology, and the Quebec institutes at Vaudreuil and Montreal. These are all two-year courses.

The course at Calgary emphasizes the operation, servicing, and planning of recreational facilities, such as turf, swimming pools, camps, waterfronts, and ice and gives the student an appreciation of the architectural and engineering aspects of facility planning. The graduate of this course may find employment with municipal recreation departments, private recreation clubs, YW and YMCA's, school boards, and university athletic departments.

The course at Centennial College, on the other hand, is designed to train supervisors of programs of activities as well as managers of recreation facilities. There is an emphasis on psychology, leadership, and supervision in addition to various activities.

The St. Clair College course is of a similar nature. It trains the student to organize and supervise recreation, games, arts and crafts, and sports and to act as an assistant to recreation directors in cities, large industries, and private clubs.

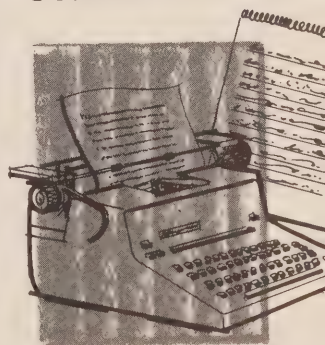
The course given at the Quebec institutes trains the student to assume responsibility for organizing physical, social, and cultural activities and to assist in the general organization and operation of recreation services. The range of opportunities for graduates of this course extends from parks, recreation centres, golf courses, swimming pools, and camps to hotels, youth hostels, and other such organizations.

Secretarial, clerical, and general office work constitutes one of the largest fields of female employment and is absorbing an increasing number of men. Commerce, industry, government, and the professions all need superior secretaries capable of accepting responsibility. Their work requires a skill and knowledge surpassing routine stenography.

In the Maritimes, a one-year course in secretarial science is offered at the College of Trades and Technology, St. John's and at the New Brunswick Institute of Technology, Moncton. Algonquin College, formerly the Eastern Ontario Institute of Technology, Ottawa, also gives a one-year course in this discipline.

RECREATION TECHNOLOGY

SECRETARIAL SCIENCE



Two-year courses are offered at the Manitoba Institute of Technology, Winnipeg; the Saskatchewan Technical Institute, Moose Jaw; the Northern and Southern Alberta Institutes of Technology, Edmonton and Calgary; and Vancouver City College. The Northern Alberta Institute is also experimenting with a one-year course for vocational high school business graduates.

Courses in secretarial science of three years' duration are given at Ryerson Polytechnical Institute, Toronto, the Centennial College of Applied Arts and Technology, Scarborough, and at the St. Clair College of Applied Arts and Technology, Windsor. Graduates of this three-year course in Ontario are eligible to enter the College of Education to become commercial teachers in the province's secondary schools.

In Quebec, secretarial science is included in the commercial science course given at the technological institutes of Sherbrooke and Trois-Rivières and in the commercial techniques course offered at the Jonquière and Chicoutimi institutes of technology. These courses are three years in length.

The secretarial science course provides advanced training which prepares students for positions of responsibility. The interested student should possess a pleasant personality, initiative, knowledge of how to act with tact in personal relations, and must have acquired a sound understanding of business and industry. Entrance requirements usually include a commercial course diploma or secondary school certificate. In addition to a thorough training in stenographic skills and office procedures, the course includes study in business subjects and broad liberal disciplines.

Secretarial science graduates have excellent opportunities for advancement to secretarial positions of greater responsibility in financial and insurance companies, banks, industrial enterprises, in professional services, or in government service. About 225 such graduates are expected in 1968. Those graduating in 1967 received starting salaries in the range of \$335 per month.

SOCIAL WELFARE SERVICES

One of the newest areas in which institutes of technology are providing courses is that of social welfare services. Such courses will help alleviate the severe shortage of personnel in this field and free the limited number of professional social workers to make better use of their advanced training.

At least eight institutes now offer social welfare programs: Ryerson, Centennial College (Scarborough), the Northern Alberta Institute of Technology, Vancouver City College, and the Quebec institutes at Sherbrooke, Jonquière, Montreal, and Trois-Rivières. The courses offered are two years in length at the four English-speaking institutes and three years at those in Quebec.

These courses usually provide a background knowledge of the social and behavioural sciences such as economics, sociology, government, and psychology; a study of the theory and practice of social welfare; interviewing, and other social work techniques and community welfare resources, and as well offer a period of field work practice to apply what has been learned to practical situations.

Ryerson offers two courses, one in welfare services which fits into the preceding description, and one in welfare institutions management. The latter course is especially designed for old age institutions and offers training in all phases of management.

Training in social welfare services allows the graduate to enter a wide variety of employment. This ranges from welfare departments, community development, and hospitals to child care or working with the mentally or physically handicapped, with youth, with the aged, and with juvenile and adult offenders.

Graduates in social welfare are in strong demand and received starting salaries of about \$425 in 1967.

The tremendous growth within recent years in the development of natural resources in the exploration and mapping of new areas, and in the construction of new highways, combined with the radical changes in surveying techniques and equipment have created a great demand for the qualified surveyor. Indeed, the Northern Alberta Institute of Technology reports that the present demand for surveyors is so great that it is very unlikely that the supply will be sufficient for some years to come. Therefore, notwithstanding the increase in the number of graduates from 53 in 1966 to over 100 in 1967, the demand will still exceed the supply for the survey technologist and starting salaries will remain highly competitive, in the range of \$400 to \$500 per month.

There are presently five institutes offering a two-year diploma course in surveying technology—the College of Trades and Technology at St. John's, the Nova Scotia Land Survey Institute, and the British Columbia, Northern Alberta and Southern Alberta Institutes of Technology. In addition, the Ryerson Polytechnical Institute for the first time will offer a separate three-year diploma course in surveying technology beginning in the fall of 1967. Also, the British Columbia Institute of Technology plans to offer a special photogrammetry option this fall. Basically the admission requirements to all of these institutes is a high school graduation diploma or its equivalent, although with a shortage of physical space in some of the schools, many students who enter this discipline possess an honours graduation diploma from high school. The applicant should have a strong grounding in mathematics and physics.

The curriculum in this field usually includes an extensive course in surveying, using such modern instruments as the geodimeter and the tellurometer, as well as a thorough study of the theory of surveying. The student will also be involved in intensive study in such areas as mathematics (from simple arithmetic through algebra, geometry, plane and spherical trigonometry to calculus), physics, geology, astronomy, photogrammetry, geodesy, cartography, and hydrography. One-year certificate courses are given at the College of Trades and Technology at St. John's in photogrammetry and cartographic drafting.

In addition to equipping the student with the necessary skills and knowledge to carry on as a surveyor, the diploma courses are designed to prepare him for the professional examinations of the provincial or dominion land surveyors associations. Successful completion of these exams together with a three-year period of articles will confer on the student the professional standing of land surveyor. On application to these associations the technology graduate may have his period of articles reduced and possibly be given credit for some of the preliminary examinations.

As land for expanding cities must be subdivided, and topographical and geological features must be explored, surveyed, and

SURVEYING TECHNOLOGY



located in such industries as oil, mining, highway construction, irrigation, and power, the employment opportunities are not only numerous but extremely varied. Graduates may choose employment in private surveying and consulting engineering firms; in gas, oil, construction, and utility companies; or in federal, provincial, and municipal highway planning and engineering departments. Within these areas the graduate may perform such functions as the exploration of natural resources, road and building construction, large scale map making, or geological, geophysical, geodetic, mine, topographical, or hydrographical surveys.

The textile industry occupies an important place in the industrial activity of Canada. Formerly done by hand, textile making has grown to become the preserve of large factories. It is for this reason that it requires an increasing number of specialists in the textile field.

Mohawk College of Applied Arts and Technology in Hamilton and l'Institut des textiles de Saint-Hyacinthe are the only two institutions which give a course in textile technology. Those interested in such training should have acquired in advance a sound basic knowledge of science and mathematics.

Textile technology students receive a basic training and wide-ranging instruction which enables them to perform the complex tasks of direction, administration, manufacturing, and production in this very automated industry. The course is three years in length.

Graduates in textile technology can look forward to attractive positions in the textile industry such as chief of quality control, textile chemist, dyer, tissue designer, research and development assistant, assistant superintendent of fabric treatment and analysis, sales and service technician in the synthetic fibres industry, colouring chemist, production controller, and laboratory technologist.

A total of 66 graduates in textile technology are expected in 1968 which represents an increase of almost 70 per cent over the number of graduates in 1967. According to the Canadian Textile Institute, new graduates in the textile industry can expect to receive salaries varying between \$5,000 and \$6,000 per year.

TEXTILE TECHNOLOGY

The following tables deal with starting salaries offered to 1966 and 1967 graduates and with the estimated number of graduates, by discipline, of technological institutes in 1967 and 1968.

The starting salaries reported here for 1966 and 1967 graduates are based on surveys of over 200 national employers conducted during these two years by the Pay Research Bureau in co-operation with the Professional and Technical Occupations Section. These results were supplemented by information provided by placement and career planning personnel. No figures are given where there was insufficient information obtained to provide a valid estimate of starting salaries.

The figures reported are, of course, averages, covering all types of employment for graduates of many institutions in a particular discipline. The rates reported showed certain regional variations. Speaking very generally, it may be said that the rates reported by institutes in Ontario were on the average about \$40 per month above, and in Quebec, about \$40 per month below, the rates reported by institutions in other parts of the country.

According to the average rates cited in Table One, however, starting salary rates for graduates of technological institutes generally rose substantially from 1966 to 1967. The increases ranged from 4 per cent in computer technology (where the 1966 rate was especially high) to 22 per cent in accounting. The average increase was in the nature of 15 per cent.

Table Two estimates the number of students expected to graduate by discipline from each of the established institutes of technology in 1967 and 1968. These figures were obtained from a survey conducted by the Education Division of the Dominion Bureau of Statistics and edited for use in this booklet.

APPENDIX

Estimated 1966 and 1967 Starting Salaries

Estimated 1967 and 1968 Graduations

TABLE ONE

Technological Institutes — Estimated Monthly Starting Salaries 1966 and 1967
Graduates

DISCIPLINE	1966	1967
	\$ per month	\$ per month
Business Administration:		
General.....	415	460
Accounting and Finance.....	370	450
Computer.....	455	475
Industrial Management.....	—	470
Marketing and Retailing.....	—	450
Secretarial Science.....	—	335
Engineering Technologies:		
Aeronautical.....	400	500
Architectural.....	410	440
Automotive.....	330	370
Biochemical.....	400	475
Chemical.....	415	470
Civil and Construction.....	400	460
Drafting.....	380	410
Electrical.....	395	460
Electronic.....	400	460
Forestry and Forest Products.....	395	435
Gas and Oil.....	445	475
Instrumentation.....	—	420
Machine Shop.....	350	420
Mechanical.....	420	465
Metallurgical.....	390	460
Mining.....	440	490
Pulp and Paper.....	—	510
Thermal*.....	370	410
Others:		
Agricultural.....	—	400
Food.....	—	400
Journalism.....	—	420
Medical Laboratory and X-Ray.....	—	370
Welfare.....	—	425

*Includes Air Conditioning, Refrigeration and Heating

TABLE TWO
Technological Institutes—Estimated Graduations by Disciplines (1967-68)

INSTITUTES	Accountancy		Aeronautical		Air Con. & Refrig.		Architecture		Auto & Diesel	
	67	68	67	68	67	68	67	68	67	68
Coll. of Fisheries, Nav., Mar. Eng., & Elect., St. John's..... (1)	—	—	—	—	—	—	—	—	—	—
Nfld. Coll. of Trades and Tech., St. John's..... (2)	15	18	—	—	—	—	5	15	—	—
Nova Scotia Inst. of Tech., Halifax..... (3)	—	—	—	—	—	—	—	—	—	—
New Brunswick Inst. of Tech., Moncton..... (4)	23	60	—	—	—	—	25	31	—	—
Saint John Inst. of Tech., Saint John..... (5)	—	—	—	—	—	—	—	—	—	—
Institut aérotechnique du Québec, Dorval..... (6)	—	—	34	46	—	—	—	—	—	—
Institut de Technologie, Chicoutimi..... (7)	—	—	—	—	—	—	—	—	8	9
Institut de Technologie, Hull..... (8)	—	—	—	—	—	—	—	—	2	—
Institut de Technologie, Jonquière — Kenogami..... (9)	—	—	—	—	—	6	—	—	26	15
Institut de Technologie, Lauzon..... (10)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Montréal..... (11)	—	—	—	—	—	—	32	49	53	29
Institut de Technologie, Québec..... (12)	—	—	—	—	8	9	—	—	16	—
Institut de Technologie, Rimouski..... (13)	—	—	—	—	17	6	—	—	23	17
Institut de Technologie, Shawinigan..... (14)	—	—	—	—	—	—	—	—	18	7
Institut de Technologie, Sherbrooke..... (15)	—	—	—	—	—	—	—	—	9	13
Institut de Technologie, Tracy..... (16)	—	—	—	—	8	—	—	—	—	—
Institut de Technologie, Trois-Rivières..... (17)	—	—	—	—	8	8	—	—	61	14
Institut de Technologie, Vaudreuil..... (18)	—	—	—	—	5	5	—	—	—	—
Institut de Technologie Laval, Montréal..... (19)	—	—	—	—	32	17	—	—	—	—
Institut de Marine, Rimouski..... (20)	—	—	—	—	—	—	—	—	—	—
Écoles de Métiers du Québec..... (21)	—	—	—	—	—	—	—	—	—	109
Algonquin College of Applied Arts & Technology..... (22)	—	—	—	—	—	—	—	—	—	—
Mohawk College of Applied Arts & Technology..... (23)	—	—	—	—	—	—	—	—	—	—
Lakehead (Lakehead Univ.), Fort William..... (24)	—	—	—	—	—	—	—	—	—	—
Northern Ont. Inst. of Tech., Kirkland Lake..... (25)	—	—	—	—	—	—	—	—	—	—
Provincial Inst. of Mining, Haileybury..... (26)	—	—	—	—	—	—	—	—	—	—
Ryerson Polytech. Inst., Toronto..... (27)	—	—	12	13	—	—	67	98	—	—
Western Ont. Inst. of Tech., Windsor..... (28)	—	—	—	—	—	—	—	—	—	—
Manitoba Inst. of Tech., Winnipeg..... (29)	—	—	—	—	—	—	—	—	—	—
Saskatchewan Tech. Inst., Moose Jaw..... (30)	20	29	—	—	—	—	20	26	—	—
Saskatchewan Institute of Applied Arts & Science..... (31)	—	—	—	—	—	—	—	—	—	—
Northern Alberta Inst. of Tech., Edmonton..... (32)	—	—	—	—	12	12	—	—	—	—
Southern Alberta Inst. of Tech., Calgary..... (33)	—	—	7	7	9	12	23	31	24	24
British Columbia Inst. of Tech., Burnaby..... (34)	—	—	—	—	—	—	22 ⁽¹⁾	30 ⁽¹⁾	—	—
Estimated Totals.....	58	107	53	66	99	75	194	280	240	237

⁽¹⁾ Building technology

TABLE TWO—(Cont.)

Technological Institutes—Estimated Graduations by Disciplines (1967-68)

Bio-chemistry		Bus. Admin.		Chemical Tech.		Civil & Survey		Communi-cations		Computer Tech.		Dental Tech.		Draft. Tech.		Elect. Tech.		Electronics Tech.		
67	68	67	68	67	68	67	68	67	68	67	68	67	68	67	68	67	68	67	68	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	5	(1)
—	—	5	15	—	—	19	33	—	—	—	—	—	—	—	—	7	8	23	31	(2)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	9	20	24	(3)
—	—	—	—	—	—	7	16	—	—	—	—	—	—	—	—	9	60	19	—	(4)
—	—	17	29	11	17	8	27	—	—	—	—	—	—	—	—	—	—	6	20	(5)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(6)
—	—	—	—	—	—	—	—	20	—	—	—	—	—	—	—	32	11	24	24	(7)
—	—	—	—	20	35	—	—	—	—	—	—	—	—	—	—	5	9	17	25	(8)
—	—	—	—	27	58	—	—	—	—	—	—	—	—	14	36	22	16	—	—	(9)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	46	24	—	—	(10)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	138	70	91	79	(11)
—	—	—	—	—	—	13	35	—	—	—	—	—	—	—	—	39	19	45	82	(12)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43	47	28	33	(13)
—	—	—	—	50	54	—	—	—	—	—	—	—	—	—	5	22	10	31	43	(14)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15	13	33	20	(15)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31	—	—	(16)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	87	22	65	(17)
—	—	—	—	—	—	13 ⁽¹⁾	16 ⁽¹⁾	—	—	—	—	—	—	—	—	7	5	—	7	(18)
42	95	—	—	60	99	15	47	—	—	—	—	—	—	—	—	36	29	—	—	(19)
—	—	—	—	—	—	—	—	9	—	—	—	—	—	—	—	—	—	—	—	(20)
—	—	—	—	—	—	—	—	18	—	—	—	—	—	—	—	—	261	—	—	(21)
9	31	68	112	17	43	31	44	—	—	—	—	—	—	—	—	—	—	46	102	(22)
—	—	16	48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	44 ⁽⁶⁾	74 ⁽⁵⁾	(23)
—	—	18	29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(24)
—	—	27	40	—	16	13	22	—	—	—	—	—	—	—	—	—	—	20	48	(25)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(26)
—	—	329	420	62	101	62	95	112	112	—	—	—	—	—	—	52	53	105	107	(27)
—	—	32	50	36	36	—	—	—	—	—	—	—	—	—	—	—	—	32	48	(28)
—	—	60	75	13	15	32	45	—	—	—	—	—	—	—	17	14	14	44	35	(29)
—	—	16	27	—	—	26	57	—	—	—	—	—	—	13	20	12	19	27	50	(30)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(31)
—	—	62	118	47	88	34	76	22 ⁽²⁾	59 ⁽²⁾	—	—	14	20	20	49	9	23	52	216	(32)
—	—	—	30	36	28	18 ⁽⁴⁾	18 ⁽⁴⁾	18	18	—	22	—	—	20	30	11 ⁽³⁾	18 ⁽³⁾	30	50	(33)
—	—	75	143	24	33	44 ⁽⁶⁾	56 ⁽⁶⁾	26	37	—	—	—	—	—	—	52	68	—	—	(34)
51	126	725	1136	403	623	335	587	198	253	—	22	14	20	67	173	668	839	788	1179	

(1) Includes 8-6 Road construction technology

(2) Includes 16-28 Photographic technology

(3) Includes 11-17 Power Engineering technology

(4) Includes 8-25 Structural technology

(5) Includes 16 Control systems technology

(6) Includes 21-25 Surveying technology

TABLE TWO (Cont.)

Technological Institutes—Estimated Graduations by Disciplines (1967-68)

INSTITUTES	Food Tech.		Forest Tech.		Gas & Oil		Hotel Motel & Rest. Admin.		Instru. & Control	
	67	68	67	68	67	68	67	68	67	68
Coll. of Fisheries, Nav., Mar. Eng., & Elect., St. John's..... (1)	—	—	—	—	—	—	—	—	—	—
Nfld. Coll. of Trades and Tech., St. John's..... (2)	—	—	9	13	—	—	—	—	—	—
Nova Scotia Inst. of Tech., Halifax..... (3)	—	—	—	—	—	—	—	—	—	—
New Brunswick Inst. of Tech., Moncton..... (4)	—	—	—	—	—	—	—	—	—	—
Saint John Inst. of Tech., Saint John..... (5)	—	—	—	—	—	—	—	—	8	11
Institut aérotechnique du Québec, Dorval..... (6)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Chicoutimi..... (7)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Hull..... (8)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Jonquière — Kenogami..... (9)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Lauzon..... (10)	—	—	—	—	—	—	—	—	29	18
Institut de Technologie, Montréal..... (11)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Québec..... (12)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Rimouski..... (13)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Shawinigan..... (14)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Sherbrooke..... (15)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Tracy..... (16)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Trois-Rivières..... (17)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Vaudreuil..... (18)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie Laval, Montréal..... (19)	—	—	—	—	—	—	—	—	47	82
Institut de Marine, Rimouski..... (20)	—	—	—	—	—	—	—	—	—	—
Écoles de Métiers du Québec..... (21)	—	—	—	—	—	—	—	—	—	—
Algonquin College of Applied Arts & Technology..... (22)	—	—	—	—	—	—	—	—	—	—
Mohawk College of Applied Arts & Technology..... (23)	—	—	—	—	—	—	—	—	—	—
Lakehead (Lakehead Univ.), Fort William..... (24)	—	—	15	41	—	—	—	—	—	—
Northern Ont. Inst. of Tech., Kirkland Lake..... (25)	—	—	—	—	—	—	—	—	—	—
Provincial Inst. of Mining, Haileybury..... (26)	—	—	—	—	—	—	—	—	—	—
Ryerson Polytech. Inst., Toronto..... (27)	77 ⁽²⁾	152 ⁽²⁾	—	—	4	5	24	32	7	8
Western Ont. Inst. of Tech., Windsor..... (28)	—	—	—	—	—	—	—	—	—	—
Manitoba Inst. of Tech., Winnipeg..... (29)	—	—	—	—	—	—	—	—	—	—
Saskatchewan Tech. Inst., Moose Jaw..... (30)	—	—	—	—	—	—	—	—	—	—
Saskatchewan Institute of Applied Arts & Science..... (31)	12	13	26 ⁽¹⁾	27 ⁽¹⁾	—	—	—	—	—	—
Northern Alberta Inst. of Tech., Edmonton..... (32)	17 ⁽⁵⁾	25 ⁽⁵⁾	27	43	24 ⁽³⁾	56 ⁽³⁾	—	—	—	—
Southern Alberta Inst. of Tech., Calgary..... (33)	—	—	—	—	33	35	12	15	—	—
British Columbia Inst. of Tech., Burnaby..... (34)	17	22	44 ⁽⁴⁾	63 ⁽⁴⁾	11	15	20	43	30	25
Estimated Totals.....	123	212	112	174	72	111	56	90	121	144

(1) Renewable Resources Technology

(2) Home Economics

(3) Includes 11-34 Exploration Technology

(4) Includes 26-32 Forestry Technology
18-31 Forest Products Technology

(5) Dietary Service

TABLE TWO (Cont.)

Technological Institutes—Estimated Graduations by Disciplines (1967-68)

Machine Shop		Mechanical		Med. Lab.		Med. X-Ray		Metal & Mining		Secretarial		Social Work		Tool Making		Welding		Fisheries Tech.	
67	68	67	68	67	68	67	68	67	68	67	68	67	68	67	68	67	68	67	68
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	6
—	—	3	8	7	23	—	13	2	4	4	—	—	—	—	—	—	—	—	(1)
—	—	9	9	62	80	—	—	—	—	—	—	35	—	—	—	—	—	—	(2)
—	—	11	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(3)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(4)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(5)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(6)
16	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	(7)
8	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	(8)
12	9	—	—	—	—	—	—	—	—	—	—	53	—	—	—	—	—	—	(9)
13	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	1	—	(10)
47	49	—	—	—	—	—	—	—	—	—	—	235	60	—	17	13	—	—	(11)
18	30	—	—	—	—	—	—	—	—	—	—	—	12	—	—	—	—	—	(12)
12	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(13)
43	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(14)
12	6	—	—	—	—	—	—	11	—	—	—	124	—	—	2	2	—	—	(15)
—	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(16)
63	27	—	—	—	—	—	—	23	47	—	—	84	49	—	14	7	—	—	(17)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(18)
30	34	—	—	—	—	133	173	—	—	—	—	—	—	—	—	—	—	—	(19)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(20)
—	234	—	—	—	—	—	—	—	15	—	—	—	38	—	—	20	—	8	(21)
—	—	31	49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(22)
—	—	35	57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(23)
—	—	24	41	—	—	—	—	8	10	—	—	—	—	—	—	—	—	—	(24)
—	—	19	21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(25)
—	—	—	—	—	—	—	—	91	100	—	—	—	—	—	—	—	—	—	(26)
—	—	70	89	—	—	—	—	—	—	54	76	29	38	—	—	—	—	—	(27)
—	—	33	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(28)
—	—	20	22	85	100	55	30	—	—	24	25	—	—	—	—	—	—	—	(29)
—	—	20	22	—	—	—	—	—	—	19	28	—	—	—	—	—	—	—	(30)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(31)
—	—	—	—	—	77	—	32	—	—	16	59	—	—	—	—	—	—	—	(32)
—	—	7	21	—	18	—	—	—	—	—	40	—	—	—	—	—	—	—	(33)
—	—	35	43	60	77	51	48	10	22	—	—	—	—	—	—	—	—	—	(34)
274	479	317	448	214	375	239	296	145	198	117	228	64	572	121	—	40	43	8	14

TABLE TWO (Cont.)

Technological Institutes—Estimated Graduations by Disciplines (1967-68)

INSTITUTES	Marine Engineering		Nautical Science		Naval Architecture		Wood-working		Others	
	67	68	67	68	67	68	67	68	67	68
Coll. of Fisheries, Nav., Mar. Eng. & Elect., St. John's (1)	—	5	—	5	—	2	—	—	—	1 ⁽¹⁾
Nfld. Coll. of Trades and Tech., St. John's..... (2)	—	—	—	—	—	—	—	—	—	—
Nova Scotia Inst. of Tech., Halifax..... (3)	—	—	—	—	—	—	—	—	—	—
New Brunswick Inst. of Tech., Moncton..... (4)	—	—	—	—	—	—	—	—	—	—
Saint John Inst. of Tech., Saint John..... (5)	—	—	—	—	—	—	—	—	—	—
Institut aérotechnique du Québec, Dorval..... (6)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Chicoutimi..... (7)	—	—	—	—	—	—	7	6	—	—
Institut de Technologie, Hull..... (8)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Jonquière — Kénogami..... (9)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Lauzon..... (10)	—	—	—	—	—	—	9	2	—	—
Institut de Technologie, Montréal..... (11)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Québec..... (12)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Rimouski..... (13)	—	—	—	—	—	—	10	10	—	—
Institut de Technologie, Shawinigan..... (14)	—	—	—	—	—	—	1	5	—	—
Institut de Technologie, Sherbrooke..... (15)	—	—	—	—	—	—	11	8	—	—
Institut de Technologie, Tracy..... (16)	—	—	—	—	—	—	—	—	—	—
Institut de Technologie, Trois-Rivières..... (17)	—	—	—	—	—	—	19	14	—	—
Institut de Technologie, Vaudreuil..... (18)	—	—	—	—	—	—	2	—	13 ⁽²⁾	11 ⁽²⁾
Institut de Technologie Laval, Montréal..... (19)	—	—	—	—	—	—	—	—	—	—
Institut de Marine, Rimouski..... (20)	4	6	—	—	—	—	—	—	—	21 ⁽³⁾
Écoles de Métiers du Québec..... (21)	—	—	—	—	—	—	—	16	—	19 ⁽⁴⁾
Algonquin College of Applied Arts & Technology..... (22)	—	—	—	—	—	—	—	—	—	—
Mohawk College of Applied Arts & Technology..... (23)	—	—	—	—	—	—	—	—	37 ⁽⁶⁾	74 ⁽⁶⁾
Lakehead (Lakehead Univ.), Fort William..... (24)	—	—	—	—	—	—	—	—	—	—
Northern Ont. Inst. of Tech., Kirkland Lake..... (25)	—	—	—	—	—	—	—	—	—	—
Provincial Inst. of Mining, Haileybury..... (26)	—	—	—	—	—	—	—	—	—	—
Ryerson Polytech. Inst., Toronto..... (27)	—	—	—	—	—	—	—	—	153 ⁽⁵⁾	126 ⁽⁵⁾
Western Ont. Inst. of Tech., Windsor..... (28)	—	—	—	—	—	—	—	—	—	—
Manitoba Inst. of Tech., Winnipeg..... (29)	—	—	—	—	—	—	—	—	—	—
Saskatchewan Tech. Inst., Moose Jaw..... (30)	—	—	—	—	—	—	—	—	4 ⁽⁹⁾	—
Saskatchewan Institute of Applied Arts & Science..... (31)	—	—	—	—	—	—	—	—	—	—
Northern Alberta Inst. of Tech., Edmonton..... (32)	—	—	—	—	—	—	—	—	9 ⁽⁸⁾	9 ⁽⁸⁾
Southern Alberta Inst. of Tech., Calgary..... (33)	—	—	—	—	—	—	—	—	176 ⁽⁷⁾	296 ⁽⁷⁾
British Columbia Inst. of Tech., Burnaby..... (34)	—	—	—	—	—	—	—	—	—	—
Estimated Totals.....	4	11	—	5	—	2	59	61	385	531

(1) Plant Engineering

(2) Water Treatment

(3) Navigation

(4) Furniture Making & Design

(5) Includes 38-20 Production Technology, 16-20 Furniture and Interior Design, 16-20 Printing Management, 44-0 Health Inspectors, 10-28 Nursing, 29-38 Welfare Services

(6) Includes 30-48 Industrial Management and 7-26 Textile Technology

(7) Includes 82-56 Art, 33-30 Merchandising Administration

(8) Production Technology

(9) Retailing

